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GEOCENTRIC EPHEMERIS OF PLUTO

1975 – 1985

by

G. H. Kaplan

Geocentric Ephemeris of Pluto, 1975—1985

This ephemeris of Pluto is based on the new numerical integration of Pluto's heliocentric motion described by P. K. Seidelmann, G. H. Kaplan, K. F. Pulkkinen, E. J. Santoro and T. C. Van Flandern at the conference honoring the 50th anniversary of Pluto's discovery, held at the New Mexico State University in February of 1980 (see *Icarus*, 1980 in press). For this integration, the Pluto/Charon system was represented as a single point mass of 1/130,000,000 solar masses, subject to the solar attraction and to perturbations from the other eight planets. New IAU (1976) masses were used for the other planets, and their heliocentric positions were taken from the JPL DE-102 ephemeris. The integration covered the years 1900 through 2000, and was fitted to all observational data available by 1980, spanning the years 1914 through 1979.

In constructing the geocentric ephemeris, a portion of which is presented in the Circular, the position and velocity of the Earth were taken from the JPL DE-102 ephemeris. The complete geocentric ephemeris, covering the years 1900 through 2000, is available on magnetic tape from the Nautical Almanac Office, U. S. Naval Observatory.

The eight columns tabulated are, from left to right:

(1) date (0^h Ephemeris Time);
(2) apparent right ascension, referred to the true equator and equinox of date;
(3) apparent declination, referred to the true equator and equinox of date;
(4) astrometric right ascension, referred to the mean equator and equinox of 1950.0;
(5) astrometric declination, referred to the mean equator and equinox of 1950.0;
(6) true distance, in astronomical units;
(7) horizontal parallax, in seconds of arc;
(8) time of ephemeris transit.

The astrometric position of Pluto given in columns 4 and 5 is used in the reduction of photographic observations of the planet. The astrometric position is directly comparable to the mean places of stars as given in star catalogs (assuming the star positions are corrected for proper motion and parallax, if significant, to the epoch of observation), it being only necessary to correct the observations for geocentric parallax. The true distance is the actual geometric distance between the center of mass of the Earth and the center of mass of the Pluto/Charon system at the tabular time. The time of ephemeris transit is the Ephemeris Time of the instant of Pluto's transit across the ephemeris meridian.

--- 1975 ---

DATE		RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
		H M S	O ' ''	H M S	O ' ''	AU	''	H M S
JAN	4	13 00 37.363	+11 45 58.86	12 59 21.440	+11 54 14.40	30.741286	0.29	6 07 42
	8	13 00 44.089	+11 47 48.81	12 59 28.050	+11 56 05.03	30.673436	0.29	5 52 04
	12	13 00 48.789	+11 49 51.10	12 59 32.609	+11 58 08.17	30.606218	0.29	5 36 26
	16	13 00 51.409	+11 52 05.26	12 59 35.107	+12 00 23.06	30.539976	0.29	5 20 45
	20	13 00 51.955	+11 54 30.52	12 59 35.551	+12 02 48.89	30.475049	0.29	5 05 01
	24	13 00 50.490	+11 57 05.71	12 59 33.963	+12 05 24.75	30.411759	0.29	4 49 16
	28	13 00 47.043	+11 59 49.87	12 59 30.377	+12 08 09.70	30.350405	0.29	4 33 29
FEB	1	13 00 41.599	+12 02 42.48	12 59 24.833	+12 11 02.84	30.291266	0.29	4 17 39
	5	13 00 34.244	+12 05 42.31	12 59 17.369	+12 14 03.21	30.234620	0.29	4 01 49
	9	13 00 25.034	+12 08 48.22	12 59 08.036	+12 17 09.75	30.180758	0.29	3 45 56
	13	13 00 13.996	+12 11 59.30	12 58 56.903	+12 20 21.30	30.129960	0.29	3 30 01
	17	13 00 01.227	+12 15 14.31	12 58 44.054	+12 23 36.62	30.082488	0.29	3 14 05
	21	12 59 46.864	+12 18 31.75	12 58 29.591	+12 26 54.48	30.038572	0.29	2 58 07
	25	12 59 30.999	+12 21 50.46	12 58 13.621	+12 30 13.66	29.998408	0.29	2 42 07
MAR	1	12 59 13.698	+12 25 09.61	12 57 56.255	+12 33 33.01	29.962164	0.29	2 26 06
	5	12 58 55.125	+12 28 27.72	12 57 37.601	+12 36 51.38	29.930001	0.29	2 10 04
	9	12 58 35.386	+12 31 43.60	12 57 17.777	+12 40 07.56	29.902079	0.29	1 54 01
	13	12 58 14.578	+12 34 56.23	12 56 56.916	+12 43 20.29	29.878541	0.29	1 37 57
	17	12 57 52.867	+12 38 04.28	12 56 35.161	+12 46 28.33	29.859496	0.29	1 21 51
	21	12 57 30.438	+12 41 06.30	12 56 12.667	+12 49 30.47	29.845021	0.29	1 05 45
	25	12 57 07.418	+12 44 01.35	12 55 49.588	+12 52 25.63	29.835149	0.29	0 49 39
	29	12 56 43.927	+12 46 48.66	12 55 26.074	+12 55 12.80	29.829885	0.29	0 33 32
APR	2	12 56 20.164	+12 49 26.93	12 55 02.265	+12 57 51.05	29.829230	0.29	0 17 25
	6	12 55 56.250	+12 51 55.32	12 54 38.308	+13 00 19.43	29.833178	0.29	0 01 17
	10	12 55 32.311	+12 54 13.10	12 54 14.359	+13 02 36.98	29.841703	0.29	23 41 08
	14	12 55 08.535	+12 56 19.22	12 53 50.575	+13 04 42.84	29.854746	0.29	23 25 01
	18	12 54 45.108	+12 58 12.71	12 53 27.117	+13 06 36.22	29.872213	0.29	23 08 54
	22	12 54 22.142	+12 59 53.16	12 53 04.138	+13 08 16.50	29.893974	0.29	22 52 48
	26	12 53 59.769	+13 01 20.19	12 52 41.776	+13 09 43.16	29.919878	0.29	22 36 42
	30	12 53 38.168	+13 02 32.99	12 52 20.158	+13 10 55.77	29.949775	0.29	22 20 37
MAY	4	12 53 17.427	+13 03 31.34	12 51 59.412	+13 11 53.91	29.983513	0.29	22 04 33
	8	12 52 57.657	+13 04 15.01	12 51 39.667	+13 12 37.16	30.020924	0.29	21 48 30
	12	12 52 39.022	+13 04 43.46	12 51 21.049	+13 13 05.24	30.061812	0.29	21 32 28
	16	12 52 21.657	+13 04 56.36	12 51 03.679	+13 13 17.94	30.105954	0.29	21 16 27
	20	12 52 05.622	+13 04 53.97	12 50 47.666	+13 13 15.22	30.153099	0.29	21 00 28
	24	12 51 51.022	+13 04 36.34	12 50 33.099	+13 12 57.15	30.202990	0.29	20 44 30
	28	12 51 37.973	+13 04 03.27	12 50 20.056	+13 12 23.85	30.255379	0.29	20 28 34
JUNE	1	12 51 26.505	+13 03 15.15	12 50 08.610	+13 11 35.44	30.310024	0.29	20 12 39
	5	12 51 16.682	+13 02 12.23	12 49 58.835	+13 10 32.05	30.366674	0.29	19 56 46
	9	12 51 08.612	+13 00 54.45	12 49 50.798	+13 09 13.92	30.425059	0.29	19 40 55
	13	12 51 02.360	+12 59 22.09	12 49 44.559	+13 07 41.36	30.484888	0.29	19 25 05
	17	12 50 57.919	+12 57 35.94	12 49 40.163	+13 05 54.83	30.545856	0.29	19 09 18
	21	12 50 55.347	+12 55 36.35	12 49 37.635	+13 03 54.86	30.607663	0.29	18 53 32
	25	12 50 54.682	+12 53 23.67	12 49 36.990	+13 01 41.99	30.670029	0.29	18 37 48
	29	12 50 55.891	+12 50 58.71	12 49 38.240	+12 59 16.72	30.732688	0.29	18 22 06

--- 1975 ---

DATE	RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
	H M S	D ' "	H M S	D ' "	AU	"	H M S
JULY 3	12 50 58.987	+12 48 22.01	12 49 41.397	+12 56 39.60	30.795367	0.29	18 06 26
7	12 51 04.019	+12 45 33.89	12 49 46.466	+12 53 51.21	30.857784	0.29	17 50 47
11	12 51 10.976	+12 42 35.03	12 49 53.448	+12 50 52.21	30.919645	0.28	17 35 11
15	12 51 19.794	+12 39 26.53	12 50 02.324	+12 47 43.36	30.980648	0.28	17 19 36
19	12 51 30.486	+12 36 08.93	12 50 13.062	+12 44 25.48	31.040513	0.28	17 04 04
23	12 51 43.017	+12 32 42.91	12 50 25.620	+12 40 59.33	31.098984	0.28	16 48 33
27	12 51 57.304	+12 29 09.50	12 50 39.957	+12 37 25.66	31.155820	0.28	16 33 04
31	12 52 13.319	+12 25 29.38	12 50 56.034	+12 33 45.21	31.210783	0.28	16 17 36
AUG 4	12 52 31.056	+12 21 43.09	12 51 13.807	+12 29 58.76	31.263628	0.28	16 02 11
8	12 52 50.445	+12 17 51.53	12 51 33.223	+12 26 07.14	31.314108	0.28	15 46 47
12	12 53 11.383	+12 13 55.92	12 51 54.219	+12 22 11.25	31.361974	0.28	15 31 24
16	12 53 33.844	+12 09 56.85	12 52 16.716	+12 18 12.04	31.407006	0.28	15 16 03
20	12 53 57.733	+12 05 55.21	12 52 40.630	+12 14 10.36	31.449017	0.28	15 00 43
24	12 54 22.938	+12 01 52.07	12 53 05.883	+12 10 07.05	31.487835	0.28	14 45 25
28	12 54 49.400	+11 57 48.15	12 53 32.395	+12 06 02.91	31.523294	0.28	14 30 08
SEPT 1	12 55 17.072	+11 53 44.03	12 54 00.088	+12 01 58.78	31.555226	0.28	14 14 52
5	12 55 45.838	+11 49 40.78	12 54 28.873	+11 57 55.55	31.583467	0.28	13 59 37
9	12 56 15.575	+11 45 39.53	12 54 58.653	+11 53 54.15	31.607858	0.28	13 44 23
13	12 56 46.228	+11 41 40.86	12 55 29.317	+11 49 55.52	31.628276	0.28	13 29 10
17	12 57 17.657	+11 37 45.75	12 56 00.755	+11 46 00.51	31.644633	0.28	13 13 58
21	12 57 49.734	+11 33 55.21	12 56 32.862	+11 42 09.91	31.656858	0.28	12 58 46
25	12 58 22.385	+11 30 09.85	12 57 05.534	+11 38 24.52	31.664888	0.28	12 43 35
29	12 58 55.528	+11 26 30.26	12 57 38.668	+11 34 45.11	31.668665	0.28	12 28 24
OCT 3	12 59 29.020	+11 22 57.50	12 58 12.156	+11 31 12.52	31.668134	0.28	12 13 14
7	13 00 02.732	+11 19 32.54	12 58 45.878	+11 27 47.60	31.663254	0.28	11 58 04
11	13 00 36.587	+11 16 15.85	12 59 19.706	+11 24 31.19	31.654026	0.28	11 42 54
15	13 01 10.420	+11 13 08.37	12 59 53.515	+11 21 24.00	31.640485	0.28	11 27 44
19	13 01 44.099	+11 10 10.92	13 00 27.188	+11 18 26.69	31.622686	0.28	11 12 34
23	13 02 17.547	+11 07 23.90	13 01 00.612	+11 15 39.90	31.600690	0.28	10 57 23
27	13 02 50.662	+11 04 47.83	13 01 33.674	+11 13 04.26	31.574566	0.28	10 42 13
31	13 03 23.287	+11 02 23.60	13 02 06.258	+11 10 40.41	31.544388	0.28	10 27 01
NOV 4	13 03 55.307	+11 00 11.88	13 02 38.240	+11 08 28.99	31.510251	0.28	10 11 50
8	13 04 26.633	+10 58 12.92	13 03 09.490	+11 06 30.58	31.472288	0.28	9 56 37
12	13 04 57.095	+10 56 27.47	13 03 39.887	+11 04 45.64	31.430672	0.28	9 41 24
16	13 05 26.579	+10 54 56.00	13 04 09.318	+11 03 14.54	31.385588	0.28	9 26 09
20	13 05 55.016	+10 53 38.57	13 04 37.679	+11 01 57.63	31.337225	0.28	9 10 54
24	13 06 22.305	+10 52 35.46	13 05 04.869	+11 00 55.19	31.285779	0.28	8 55 37
28	13 06 48.299	+10 51 47.24	13 05 30.784	+11 00 07.54	31.231451	0.28	8 40 19
DEC 2	13 07 12.919	+10 51 14.08	13 05 55.317	+10 59 34.93	31.174461	0.28	8 25 00
6	13 07 36.083	+10 50 55.91	13 06 18.361	+10 59 17.55	31.115068	0.28	8 09 39
10	13 07 57.645	+10 50 53.09	13 06 39.822	+10 59 15.40	31.053556	0.28	7 54 17
14	13 08 17.531	+10 51 05.54	13 06 59.617	+10 59 28.43	30.990221	0.28	7 38 53
18	13 08 35.707	+10 51 32.89	13 07 17.677	+10 59 56.49	30.925355	0.28	7 23 27
22	13 08 52.098	+10 52 14.97	13 07 33.938	+11 00 39.42	30.859246	0.29	7 08 00
26	13 09 06.601	+10 53 11.90	13 07 48.337	+11 01 37.00	30.792182	0.29	6 52 30
30	13 09 19.194	+10 54 23.21	13 08 00.812	+11 02 49.01	30.724466	0.29	6 36 59

GEOCENTRIC POSITIONS OF PLUTO FOR OH ET

--- 1976 ---

DATE		RA (DATE) H M S	DEC (DATE) ° ' "	RA (1950) H M S	DEC (1950) ° ' "	TRUE DIST AU	HP "	ET TRANS H M S
JAN	3	13 09 29.829	+10 55 48.37	13 08 11.307	+11 04 15.04	30.656431	0.29	6 21 26
	7	13 09 38.419	+10 57 27.21	13 08 19.783	+11 05 54.59	30.588422	0.29	6 05 51
	11	13 09 44.958	+10 59 19.04	13 08 26.217	+11 07 47.03	30.520781	0.29	5 50 14
	15	13 09 49.472	+11 01 22.93	13 08 30.601	+11 09 51.66	30.453836	0.29	5 34 34
	19	13 09 51.940	+11 03 38.24	13 08 32.936	+11 12 07.78	30.387900	0.29	5 18 53
	23	13 09 52.334	+11 06 04.52	13 08 33.227	+11 14 34.64	30.323272	0.29	5 03 10
	27	13 09 50.708	+11 08 40.70	13 08 31.481	+11 17 11.47	30.260260	0.29	4 47 24
	31	13 09 47.072	+11 11 25.83	13 08 27.716	+11 19 57.35	30.199187	0.29	4 31 37
FEB	4	13 09 41.425	+11 14 19.19	13 08 21.970	+11 22 51.25	30.140374	0.29	4 15 48
	8	13 09 33.845	+11 17 19.54	13 08 14.298	+11 25 52.05	30.084119	0.29	3 59 56
	12	13 09 24.430	+11 20 25.54	13 08 04.769	+11 28 58.63	30.030698	0.29	3 44 03
	16	13 09 13.231	+11 23 36.21	13 07 53.463	+11 32 09.88	29.980355	0.29	3 28 08
	20	13 09 00.305	+11 26 50.68	13 07 40.460	+11 35 24.68	29.933314	0.29	3 12 12
	24	13 08 45.785	+11 30 07.48	13 07 25.842	+11 38 41.93	29.889797	0.29	2 56 14
	28	13 08 29.741	+11 33 25.49	13 07 09.704	+11 42 00.39	29.850027	0.29	2 40 14
MAR	3	13 08 12.256	+11 36 43.68	13 06 52.156	+11 45 18.80	29.814211	0.30	2 24 13
	7	13 07 53.488	+11 40 00.58	13 06 33.327	+11 48 35.87	29.782526	0.30	2 08 11
	11	13 07 33.592	+11 43 14.77	13 06 13.351	+11 51 50.37	29.755110	0.30	1 52 07
	15	13 07 12.674	+11 46 25.27	13 05 52.369	+11 55 01.10	29.732067	0.30	1 36 03
	19	13 06 50.861	+11 49 31.12	13 05 30.516	+11 58 06.96	29.713475	0.30	1 19 57
	23	13 06 28.336	+11 52 30.86	13 05 07.926	+12 01 06.88	29.699404	0.30	1 03 51
	27	13 06 05.201	+11 55 23.62	13 04 44.740	+12 03 59.75	29.689924	0.30	0 47 45
	31	13 05 41.595	+11 58 08.40	13 04 21.113	+12 06 44.43	29.685078	0.30	0 31 38
APR	4	13 05 17.714	+12 00 43.95	13 03 57.205	+12 09 19.88	29.684873	0.30	0 15 30
	8	13 04 53.730	+12 03 09.19	13 03 33.179	+12 11 45.15	29.689280	0.30	23 55 21
	12	13 04 29.764	+12 05 23.51	13 03 09.193	+12 13 59.38	29.698233	0.30	23 39 14
	16	13 04 05.970	+12 07 26.21	13 02 45.393	+12 16 01.85	29.711645	0.30	23 23 06
	20	13 03 42.529	+12 09 16.29	13 02 21.920	+12 17 51.89	29.729429	0.30	23 06 59
	24	13 03 19.533	+12 10 53.39	13 01 58.913	+12 19 28.83	29.751492	0.30	22 50 53
	28	13 02 57.128	+12 12 16.91	13 01 36.521	+12 20 52.03	29.777720	0.30	22 34 47
MAY	2	13 02 35.495	+12 13 26.10	13 01 14.891	+12 22 00.95	29.807965	0.30	22 18 42
	6	13 02 14.776	+12 14 20.49	13 00 54.161	+12 22 55.19	29.842046	0.29	22 02 38
	10	13 01 55.060	+12 15 00.07	13 00 34.461	+12 23 34.47	29.879759	0.29	21 46 35
	14	13 01 36.485	+12 15 24.57	13 00 15.905	+12 23 58.62	29.920885	0.29	21 30 33
	18	13 01 19.179	+12 15 33.64	12 59 58.592	+12 24 07.55	29.965215	0.29	21 14 33
	22	13 01 03.188	+12 15 27.52	12 59 42.622	+12 24 01.12	30.012541	0.29	20 58 34
	26	13 00 48.625	+12 15 06.12	12 59 28.096	+12 23 39.29	30.062637	0.29	20 42 36
	30	13 00 35.620	+12 14 29.22	12 59 15.111	+12 23 02.09	30.115253	0.29	20 26 40
JUNE	3	13 00 24.247	+12 13 37.02	12 59 03.751	+12 22 09.67	30.170115	0.29	20 10 45
	7	13 00 14.541	+12 12 30.04	12 58 54.087	+12 21 02.30	30.226937	0.29	19 54 52
	11	13 00 06.591	+12 11 08.45	12 58 46.170	+12 19 40.34	30.285431	0.29	19 39 01
	15	13 00 00.451	+12 09 32.46	12 58 40.041	+12 18 04.18	30.345328	0.29	19 23 12
	19	12 59 56.108	+12 07 42.80	12 58 35.740	+12 16 14.17	30.406367	0.29	19 07 24
	23	12 59 53.623	+12 05 39.77	12 58 33.307	+12 14 10.71	30.468276	0.29	18 51 38
	27	12 59 53.059	+12 03 23.61	12 58 32.773	+12 11 54.27	30.530766	0.29	18 35 55

--- 1976 ---

DATE		RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
		H M S	° ' "	H M S	° ' "	AU	"	H M S
JULY	1	12 59 54.417	+12 00 54.99	12 58 34.161	+12 09 25.43	30.593535	0.29	18 20 12
	5	12 59 57.676	+11 58 14.80	12 58 37.476	+12 06 44.84	30.656277	0.29	18 04 33
	9	13 00 02.870	+11 55 23.47	12 58 42.707	+12 03 53.22	30.718699	0.29	17 48 54
	13	13 00 09.975	+11 52 21.66	12 58 49.836	+12 00 51.25	30.780532	0.29	17 33 18
	17	13 00 18.930	+11 49 10.34	12 58 58.846	+11 57 39.59	30.841523	0.29	17 17 44
	21	13 00 29.745	+11 45 50.05	12 59 09.717	+11 54 18.92	30.901409	0.28	17 02 11
	25	13 00 42.422	+11 42 21.31	12 59 22.426	+11 50 49.97	30.959919	0.28	16 46 40
	29	13 00 56.897	+11 38 45.09	12 59 36.939	+11 47 13.56	31.016779	0.28	16 31 12
AUG	2	13 01 13.105	+11 35 02.43	12 59 53.207	+11 43 30.54	31.071717	0.28	16 15 44
	6	13 01 31.034	+11 31 13.88	13 00 11.169	+11 39 41.80	31.124483	0.28	16 00 19
	10	13 01 50.595	+11 27 20.39	13 00 30.757	+11 35 48.19	31.174860	0.28	15 44 55
	14	13 02 11.692	+11 23 23.00	13 00 51.910	+11 31 50.49	31.222643	0.28	15 29 33
	18	13 02 34.298	+11 19 22.31	13 01 14.565	+11 27 49.52	31.267629	0.28	15 14 12
	22	13 02 58.362	+11 15 19.02	13 01 38.654	+11 23 46.12	31.309609	0.28	14 58 52
	26	13 03 23.776	+11 11 14.22	13 02 04.103	+11 19 41.18	31.348375	0.28	14 43 34
	30	13 03 50.447	+11 07 08.95	13 02 30.822	+11 15 35.65	31.383731	0.28	14 28 17
SEPT	3	13 04 18.321	+11 03 03.81	13 02 58.712	+11 11 30.45	31.415511	0.28	14 13 01
	7	13 04 47.263	+10 58 59.86	13 03 27.675	+11 07 26.46	31.443584	0.28	13 57 46
	11	13 05 17.161	+10 54 58.09	13 03 57.614	+11 03 24.48	31.467835	0.28	13 42 33
	15	13 05 47.958	+10 50 59.08	13 04 28.438	+10 59 25.33	31.488149	0.28	13 27 20
	19	13 06 19.566	+10 47 03.57	13 05 00.049	+10 55 29.86	31.504415	0.28	13 12 08
	23	13 06 51.846	+10 43 12.68	13 05 32.344	+10 51 38.94	31.516525	0.28	12 56 56
	27	13 07 24.691	+10 39 27.31	13 06 05.209	+10 47 53.47	31.524391	0.28	12 41 46
OCT	1	13 07 58.017	+10 35 48.02	13 06 38.519	+10 44 14.32	31.527962	0.28	12 26 35
	5	13 08 31.658	+10 32 15.89	13 07 12.156	+10 40 42.27	31.527221	0.28	12 11 25
	9	13 09 05.498	+10 28 51.71	13 07 46.006	+10 37 18.06	31.522168	0.28	11 56 15
	13	13 09 39.464	+10 25 35.95	13 08 19.959	+10 34 02.39	31.512806	0.28	11 41 05
	17	13 10 13.441	+10 22 29.31	13 08 53.902	+10 30 56.00	31.499146	0.28	11 25 55
	21	13 10 47.275	+10 19 32.77	13 09 27.719	+10 27 59.62	31.481206	0.28	11 10 45
	25	13 11 20.864	+10 16 46.99	13 10 01.281	+10 25 13.99	31.459026	0.28	10 55 35
	29	13 11 54.101	+10 14 12.40	13 10 34.457	+10 22 39.80	31.432688	0.28	10 40 24
NOV	2	13 12 26.808	+10 11 49.93	13 11 07.121	+10 20 17.63	31.402311	0.28	10 25 13
	6	13 12 58.883	+10 09 40.06	13 11 39.160	+10 18 07.97	31.368023	0.28	10 10 02
	10	13 13 30.248	+10 07 43.02	13 12 10.461	+10 16 11.30	31.329960	0.28	9 54 49
	14	13 14 00.777	+10 05 59.32	13 12 40.914	+10 14 28.10	31.288261	0.28	9 39 36
	18	13 14 30.328	+10 04 29.65	13 13 10.404	+10 12 58.81	31.243078	0.28	9 24 21
	22	13 14 58.814	+10 03 14.27	13 13 38.812	+10 11 43.87	31.194586	0.28	9 09 06
	26	13 15 26.127	+10 02 13.36	13 14 06.018	+10 10 43.62	31.142999	0.28	8 53 49
	30	13 15 52.104	+10 01 27.48	13 14 31.914	+10 09 58.25	31.088561	0.28	8 38 31
DEC	4	13 16 16.675	+10 00 56.67	13 14 56.403	+10 09 27.90	31.031526	0.28	8 23 12
	8	13 16 39.778	+10 00 40.76	13 15 19.398	+10 09 12.63	30.972144	0.28	8 07 51
	12	13 17 01.306	+10 00 39.92	13 15 40.814	+10 09 12.49	30.910670	0.28	7 52 29
	16	13 17 21.151	+10 00 54.36	13 16 00.565	+10 09 27.49	30.847362	0.29	7 37 05
	20	13 17 39.268	+10 01 23.81	13 16 18.567	+10 09 57.59	30.782502	0.29	7 21 39
	24	13 17 55.573	+10 02 08.02	13 16 34.737	+10 10 42.62	30.716402	0.29	7 06 12
	28	13 18 09.954	+10 03 07.04	13 16 49.012	+10 11 42.28	30.649394	0.29	6 50 42

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DATE		RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
		H M S	O ' ''	H M S	O ' ''	AU	''	H M S
JAN	1	13 18 22.394	+10 04 20.32	13 17 01.345	+10 12 56.17	30.581808	0.29	6 35 11
	5	13 18 32.877	+10 05 47.21	13 17 11.698	+10 14 23.82	30.513961	0.29	6 19 37
	9	13 18 41.344	+10 07 27.38	13 17 20.042	+10 16 04.75	30.446164	0.29	6 04 02
	13	13 18 47.753	+10 09 20.47	13 17 26.348	+10 17 58.43	30.378725	0.29	5 48 24
	17	13 18 52.124	+10 11 25.59	13 17 30.592	+10 20 04.27	30.311962	0.29	5 32 45
	21	13 18 54.426	+10 13 42.05	13 17 32.760	+10 22 21.54	30.246217	0.29	5 17 04
	25	13 18 54.625	+10 16 09.32	13 17 32.859	+10 24 49.38	30.181832	0.29	5 01 20
	29	13 18 52.785	+10 18 46.24	13 17 30.913	+10 27 26.87	30.119134	0.29	4 45 35
FEB	2	13 18 48.954	+10 21 31.72	13 17 26.960	+10 30 13.04	30.058424	0.29	4 29 47
	6	13 18 43.145	+10 24 24.98	13 17 21.045	+10 33 06.91	29.999982	0.29	4 13 57
	10	13 18 35.402	+10 27 25.12	13 17 13.215	+10 36 07.51	29.944078	0.29	3 58 06
	14	13 18 25.821	+10 30 30.80	13 17 03.522	+10 39 13.78	29.890982	0.29	3 42 13
	18	13 18 14.435	+10 33 41.04	13 16 52.032	+10 42 24.60	29.840969	0.29	3 26 18
	22	13 18 01.306	+10 36 54.82	13 16 38.831	+10 45 38.73	29.794303	0.30	3 10 21
	26	13 17 46.576	+10 40 10.66	13 16 24.021	+10 48 54.93	29.751216	0.30	2 54 23
MAR	2	13 17 30.360	+10 43 27.25	13 16 07.713	+10 52 11.97	29.711906	0.30	2 38 23
	6	13 17 12.740	+10 46 43.60	13 15 50.024	+10 55 28.66	29.676540	0.30	2 22 22
	10	13 16 53.841	+10 49 58.60	13 15 31.069	+10 58 43.85	29.645264	0.30	2 06 19
	14	13 16 33.818	+10 53 10.79	13 15 10.966	+11 01 56.38	29.618220	0.30	1 50 16
	18	13 16 12.755	+10 56 19.20	13 14 49.843	+11 05 05.05	29.595547	0.30	1 34 11
	22	13 15 50.791	+10 59 22.73	13 14 27.844	+11 08 08.62	29.577360	0.30	1 18 06
	26	13 15 28.117	+11 02 19.93	13 14 05.123	+11 11 05.92	29.563733	0.30	1 02 00
	30	13 15 04.884	+11 05 09.69	13 13 41.838	+11 13 55.84	29.554704	0.30	0 45 53
APR	3	13 14 41.214	+11 07 51.22	13 13 18.142	+11 16 37.39	29.550279	0.30	0 29 46
	7	13 14 17.277	+11 10 23.53	13 12 54.182	+11 19 09.64	29.550439	0.30	0 13 38
	11	13 13 53.243	+11 12 45.50	13 12 30.101	+11 21 31.71	29.555167	0.30	23 53 29
	15	13 13 29.209	+11 14 56.56	13 12 06.049	+11 23 42.72	29.564437	0.30	23 37 21
	19	13 13 05.343	+11 16 55.86	13 11 42.183	+11 25 41.81	29.578195	0.30	23 21 14
	23	13 12 41.838	+11 18 42.39	13 11 18.664	+11 27 28.23	29.596351	0.30	23 05 07
	27	13 12 18.834	+11 20 15.57	13 10 55.643	+11 29 01.35	29.618779	0.30	22 49 00
MAY	1	13 11 56.448	+11 21 35.10	13 10 33.266	+11 30 20.65	29.645329	0.30	22 32 55
	5	13 11 34.842	+11 22 40.42	13 10 11.663	+11 31 25.73	29.675833	0.30	22 16 50
	9	13 11 14.151	+11 23 31.00	13 09 50.954	+11 32 16.25	29.710132	0.30	22 00 46
	13	13 10 54.445	+11 24 06.86	13 09 31.264	+11 32 51.85	29.748063	0.30	21 44 43
	17	13 10 35.874	+11 24 27.60	13 09 12.719	+11 33 12.25	29.789437	0.30	21 28 41
	21	13 10 18.585	+11 24 32.85	13 08 55.438	+11 33 17.26	29.834035	0.29	21 12 41
	25	13 10 02.667	+11 24 22.63	13 08 39.530	+11 33 06.85	29.881615	0.29	20 56 41
	29	13 09 48.193	+11 23 57.21	13 08 25.092	+11 32 41.07	29.931916	0.29	20 40 44
JUNE	2	13 09 35.281	+11 23 16.51	13 08 12.200	+11 32 00.08	29.984677	0.29	20 24 48
	6	13 09 24.000	+11 22 20.64	13 08 00.923	+11 31 04.06	30.039651	0.29	20 08 53
	10	13 09 14.366	+11 21 10.14	13 07 51.329	+11 29 53.20	30.096593	0.29	19 53 00
	14	13 09 06.482	+11 19 45.06	13 07 43.485	+11 28 27.73	30.155242	0.29	19 37 09
	18	13 09 00.425	+11 18 05.56	13 07 37.451	+11 26 47.98	30.215313	0.29	19 21 20
	22	13 08 56.216	+11 16 12.24	13 07 33.273	+11 24 54.39	30.276506	0.29	19 05 32
	26	13 08 53.873	+11 14 05.73	13 07 30.982	+11 22 47.47	30.338519	0.29	18 49 47
	30	13 08 53.454	+11 11 46.35	13 07 30.592	+11 20 27.81	30.401059	0.29	18 34 03

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DATE		RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
		H M S	0 ' ''	H M S	0 ' ''	AU	''	H M S
JULY	4	13 08 54.950	+11 09 14.71	13 07 32.109	+11 17 55.99	30.463852	0.29	18 18 21
	8	13 08 58.328	+11 06 31.67	13 07 35.541	+11 15 12.56	30.526638	0.29	18 02 41
	12	13 09 03.634	+11 03 37.58	13 07 40.894	+11 12 18.10	30.589141	0.29	17 47 03
	16	13 09 10.877	+11 00 33.00	13 07 48.167	+11 09 13.29	30.651070	0.29	17 31 27
	20	13 09 20.012	+10 57 18.85	13 07 57.345	+11 05 58.86	30.712133	0.29	17 15 53
	24	13 09 31.008	+10 53 56.01	13 08 08.399	+11 02 35.61	30.772040	0.29	17 00 21
	28	13 09 43.867	+10 50 25.00	13 08 21.288	+10 59 04.37	30.830522	0.29	16 44 50
AUG	1	13 09 58.513	+10 46 46.74	13 08 35.964	+10 55 25.92	30.887336	0.28	16 29 21
	5	13 10 14.874	+10 43 02.22	13 08 52.383	+10 51 41.03	30.942253	0.28	16 13 54
	9	13 10 32.949	+10 39 11.97	13 09 10.502	+10 47 50.46	30.995035	0.28	15 58 29
	13	13 10 52.687	+10 35 16.75	13 09 30.269	+10 43 55.05	31.045437	0.28	15 43 05
	17	13 11 13.994	+10 31 17.64	13 09 51.621	+10 39 55.68	31.093218	0.28	15 27 43
	21	13 11 36.805	+10 27 15.58	13 10 14.484	+10 35 53.27	31.138148	0.28	15 12 22
	25	13 12 01.075	+10 23 11.20	13 10 38.773	+10 31 48.74	31.180025	0.28	14 57 03
	29	13 12 26.674	+10 19 05.57	13 11 04.401	+10 27 42.96	31.218679	0.28	14 41 45
SEPT	2	13 12 53.511	+10 14 59.67	13 11 31.286	+10 23 36.73	31.253954	0.28	14 26 28
	6	13 13 21.545	+10 10 54.05	13 11 59.348	+10 19 30.90	31.285687	0.28	14 11 13
	10	13 13 50.682	+10 06 49.58	13 12 28.499	+10 15 26.34	31.313718	0.28	13 55 58
	14	13 14 20.794	+10 02 47.38	13 12 58.644	+10 11 23.94	31.337894	0.28	13 40 45
	18	13 14 51.798	+ 9 58 48.30	13 13 29.675	+10 07 24.64	31.358081	0.28	13 25 32
	22	13 15 23.605	+ 9 54 52.99	13 14 01.477	+10 03 29.33	31.374178	0.28	13 10 20
	26	13 15 56.055	+ 9 51 02.57	13 14 33.938	+ 9 59 38.83	31.386121	0.28	12 55 09
	30	13 16 29.049	+ 9 47 17.85	13 15 06.952	+ 9 55 53.93	31.393856	0.28	12 39 58
OCT	4	13 17 02.516	+ 9 43 39.35	13 15 40.414	+ 9 52 15.39	31.397330	0.28	12 24 48
	8	13 17 36.332	+ 9 40 07.92	13 16 14.216	+ 9 48 44.02	31.396496	0.28	12 09 38
	12	13 18 10.354	+ 9 36 44.57	13 16 48.240	+ 9 45 20.63	31.391318	0.28	11 54 28
	16	13 18 44.489	+ 9 33 29.97	13 17 22.361	+ 9 42 06.03	31.381783	0.28	11 39 18
	20	13 19 18.619	+ 9 30 24.71	13 17 56.447	+ 9 39 00.99	31.367921	0.28	11 24 09
	24	13 19 52.570	+ 9 27 29.79	13 18 30.375	+ 9 36 06.18	31.349793	0.28	11 08 59
	28	13 20 26.248	+ 9 24 45.76	13 19 04.030	+ 9 33 22.20	31.327472	0.28	10 53 48
NOV	1	13 20 59.566	+ 9 22 12.98	13 19 37.297	+ 9 30 49.66	31.301035	0.28	10 38 38
	5	13 21 32.386	+ 9 19 52.17	13 20 10.061	+ 9 28 29.14	31.270563	0.28	10 23 27
	9	13 22 04.566	+ 9 17 44.08	13 20 42.200	+ 9 26 21.24	31.236154	0.28	10 08 15
	13	13 22 36.020	+ 9 15 49.07	13 21 13.588	+ 9 24 26.52	31.197933	0.28	9 53 03
	17	13 23 06.617	+ 9 14 07.53	13 21 44.095	+ 9 22 45.47	31.156063	0.28	9 37 50
	21	13 23 36.191	+ 9 12 40.17	13 22 13.605	+ 9 21 18.44	31.110742	0.28	9 22 35
	25	13 24 04.670	+ 9 11 27.13	13 22 42.012	+ 9 20 05.73	31.062172	0.28	9 07 20
	29	13 24 31.969	+ 9 10 28.49	13 23 09.215	+ 9 19 07.60	31.010555	0.28	8 52 03
DEC	3	13 24 57.961	+ 9 09 44.64	13 23 35.112	+ 9 18 24.28	30.956098	0.28	8 36 45
	7	13 25 22.530	+ 9 09 15.91	13 23 59.600	+ 9 17 55.98	30.899026	0.28	8 21 26
	11	13 25 45.616	+ 9 09 02.21	13 24 22.575	+ 9 17 42.85	30.839581	0.29	8 06 05
	15	13 26 07.101	+ 9 09 03.58	13 24 43.937	+ 9 17 44.93	30.778048	0.29	7 50 43
	19	13 26 26.859	+ 9 09 20.24	13 25 03.599	+ 9 18 02.12	30.714732	0.29	7 35 19
	23	13 26 44.861	+ 9 09 51.80	13 25 21.495	+ 9 18 34.23	30.649933	0.29	7 19 53
	27	13 27 01.052	+ 9 10 37.90	13 25 37.561	+ 9 19 21.05	30.583945	0.29	7 04 25
	31	13 27 15.344	+ 9 11 38.48	13 25 51.739	+ 9 20 22.29	30.517064	0.29	6 48 56

GEOCENTRIC POSITIONS OF PLUTO FOR 0H ET

--- 1978 ---

DATE	RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
	H M S	o ' ''	H M S	o ' ''	AU	''	H M S
JAN 4	13 27 27.679	+ 9 12 53.29	13 26 03.972	+ 9 21 37.66	30.449588	0.29	6 33 24
8	13 27 38.047	+ 9 14 21.67	13 26 14.208	+ 9 23 06.77	30.381834	0.29	6 17 51
12	13 27 46.373	+ 9 16 03.21	13 26 22.402	+ 9 24 49.11	30.314143	0.29	6 02 15
16	13 27 52.605	+ 9 17 57.54	13 26 28.532	+ 9 26 44.02	30.246868	0.29	5 46 38
20	13 27 56.780	+ 9 20 03.68	13 26 32.593	+ 9 28 50.78	30.180342	0.29	5 30 58
24	13 27 58.901	+ 9 22 20.79	13 26 34.588	+ 9 31 08.63	30.114878	0.29	5 15 17
28	13 27 58.946	+ 9 24 48.30	13 26 34.528	+ 9 33 36.77	30.050779	0.29	4 59 33
FEB 1	13 27 56.941	+ 9 27 25.39	13 26 32.427	+ 9 36 14.39	29.988345	0.29	4 43 47
5	13 27 52.943	+ 9 30 10.89	13 26 28.305	+ 9 39 00.58	29.927879	0.29	4 27 59
9	13 27 46.946	+ 9 33 03.98	13 26 22.198	+ 9 41 54.34	29.869698	0.29	4 12 10
13	13 27 38.991	+ 9 36 03.74	13 26 14.159	+ 9 44 54.56	29.814108	0.30	3 56 18
17	13 27 29.192	+ 9 39 08.75	13 26 04.264	+ 9 48 00.09	29.761385	0.30	3 40 25
21	13 27 17.621	+ 9 42 17.87	13 25 52.593	+ 9 51 09.78	29.711775	0.30	3 24 29
25	13 27 04.336	+ 9 45 30.16	13 25 39.233	+ 9 54 22.50	29.665500	0.30	3 08 32
MAR 1	13 26 49.447	+ 9 48 44.44	13 25 24.274	+ 9 57 37.11	29.622768	0.30	2 52 34
5	13 26 33.078	+ 9 51 59.30	13 25 07.811	+10 00 52.47	29.583785	0.30	2 36 34
9	13 26 15.288	+ 9 55 13.77	13 24 49.950	+10 04 07.34	29.548755	0.30	2 20 33
13	13 25 56.206	+ 9 58 26.68	13 24 30.818	+10 07 20.45	29.517860	0.30	2 04 30
17	13 25 36.008	+10 01 36.49	13 24 10.555	+10 10 30.56	29.491240	0.30	1 48 26
21	13 25 14.817	+10 04 42.10	13 23 49.302	+10 13 36.47	29.468998	0.30	1 32 21
25	13 24 52.752	+10 07 42.59	13 23 27.201	+10 16 37.09	29.451210	0.30	1 16 16
29	13 24 29.980	+10 10 36.75	13 23 04.391	+10 19 31.36	29.437933	0.30	1 00 10
APR 2	13 24 06.658	+10 13 23.38	13 22 41.011	+10 22 18.23	29.429218	0.30	0 44 03
6	13 23 42.884	+10 16 01.71	13 22 17.209	+10 24 56.65	29.425112	0.30	0 27 55
10	13 23 18.836	+10 18 30.70	13 21 53.145	+10 27 25.59	29.425629	0.30	0 11 48
14	13 22 54.707	+10 20 49.14	13 21 28.983	+10 29 44.09	29.430740	0.30	23 51 39
18	13 22 30.631	+10 22 56.33	13 21 04.884	+10 31 51.32	29.440383	0.30	23 35 31
22	13 22 06.745	+10 24 51.70	13 20 40.999	+10 33 46.57	29.454468	0.30	23 19 24
26	13 21 43.227	+10 26 34.41	13 20 17.469	+10 35 29.19	29.472894	0.30	23 03 17
30	13 21 20.215	+10 28 03.78	13 19 54.431	+10 36 58.59	29.495558	0.30	22 47 10
MAY 4	13 20 57.803	+10 29 19.55	13 19 32.027	+10 38 14.19	29.522350	0.30	22 31 04
8	13 20 36.167	+10 30 21.06	13 19 10.402	+10 39 15.48	29.553132	0.30	22 15 00
12	13 20 15.468	+10 31 07.74	13 18 49.697	+10 40 02.05	29.587727	0.30	21 58 56
16	13 19 55.806	+10 31 39.46	13 18 30.043	+10 40 33.63	29.625933	0.30	21 42 53
20	13 19 37.291	+10 31 56.19	13 18 11.555	+10 40 50.05	29.667530	0.30	21 26 51
24	13 19 20.066	+10 31 57.59	13 17 54.337	+10 40 51.26	29.712296	0.30	21 10 51
28	13 19 04.212	+10 31 43.63	13 17 38.482	+10 40 37.20	29.760015	0.30	20 54 51
JUNE 1	13 18 49.781	+10 31 14.61	13 17 24.085	+10 40 07.87	29.810472	0.30	20 38 54
5	13 18 36.911	+10 30 30.36	13 17 11.243	+10 39 23.30	29.863426	0.29	20 22 57
9	13 18 25.694	+10 29 30.89	13 17 00.040	+10 38 23.64	29.918606	0.29	20 07 03
13	13 18 16.173	+10 28 16.67	13 16 50.549	+10 37 09.15	29.975730	0.29	19 51 10
17	13 18 08.405	+10 26 48.11	13 16 42.826	+10 35 40.21	30.034508	0.29	19 35 19
21	13 18 02.472	+10 25 05.34	13 16 36.912	+10 33 57.21	30.094656	0.29	19 19 30
25	13 17 58.382	+10 23 08.91	13 16 32.840	+10 32 00.60	30.155910	0.29	19 03 43
29	13 17 56.136	+10 20 59.50	13 16 30.645	+10 29 50.80	30.218009	0.29	18 47 57

GEOCENTRIC POSITIONS OF PLUTO FOR 0H ET

--- 1978 ---

DATE		RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
		H M S	O ' "	H M S	O ' "	AU	"	H M S
JULY	3	13 17 55.814	+10 18 37.30	13 16 30.360	+10 27 28.26	30.280672	0.29	18 32 14
	7	13 17 57.435	+10 16 02.83	13 16 32.007	+10 24 53.56	30.343601	0.29	18 16 32
	11	13 18 00.977	+10 13 16.94	13 16 35.594	+10 22 07.34	30.406493	0.29	18 00 52
	15	13 18 06.444	+10 10 20.32	13 16 41.116	+10 19 10.30	30.469048	0.29	17 45 14
	19	13 18 13.856	+10 07 13.43	13 16 48.551	+10 16 03.18	30.530986	0.29	17 29 39
	23	13 18 23.149	+10 03 57.17	13 16 57.876	+10 12 46.71	30.592049	0.29	17 14 05
	27	13 18 34.285	+10 00 32.44	13 17 09.068	+10 09 21.55	30.651987	0.29	16 58 33
	31	13 18 47.284	+ 9 56 59.64	13 17 22.105	+10 05 48.44	30.710537	0.29	16 43 02
AUG	4	13 19 02.100	+ 9 53 19.61	13 17 36.953	+10 02 08.16	30.767424	0.29	16 27 33
	8	13 19 18.662	+ 9 49 33.39	13 17 53.567	+ 9 58 21.58	30.822380	0.29	16 12 06
	12	13 19 36.931	+ 9 45 41.77	13 18 11.887	+ 9 54 29.57	30.875148	0.28	15 56 41
	16	13 19 56.869	+ 9 41 45.41	13 18 31.845	+ 9 50 33.01	30.925496	0.28	15 41 18
	20	13 20 18.360	+ 9 37 45.40	13 18 53.370	+ 9 46 32.76	30.973221	0.28	15 25 56
	24	13 20 41.336	+ 9 33 42.65	13 19 16.397	+ 9 42 29.61	31.018129	0.28	15 10 35
	28	13 21 05.772	+ 9 29 37.69	13 19 40.860	+ 9 38 24.39	31.060018	0.28	14 55 16
SEPT	1	13 21 31.570	+ 9 25 31.50	13 20 06.684	+ 9 34 17.99	31.098682	0.28	14 39 58
	5	13 21 58.624	+ 9 21 25.15	13 20 33.781	+ 9 30 11.31	31.133927	0.28	14 24 42
	9	13 22 26.865	+ 9 17 19.45	13 21 02.056	+ 9 26 05.29	31.165578	0.28	14 09 26
	13	13 22 56.210	+ 9 13 15.11	13 21 31.404	+ 9 22 00.84	31.193491	0.28	13 54 12
	17	13 23 26.507	+ 9 09 13.28	13 22 01.723	+ 9 17 58.81	31.217553	0.28	13 38 59
	21	13 23 57.674	+ 9 05 14.76	13 22 32.918	+ 9 13 59.99	31.237665	0.28	13 23 46
	25	13 24 29.647	+ 9 01 20.12	13 23 04.892	+ 9 10 05.21	31.253718	0.28	13 08 34
	29	13 25 02.293	+ 8 57 30.33	13 23 37.541	+ 9 06 15.31	31.265609	0.28	12 53 23
OCT	3	13 25 35.487	+ 8 53 46.42	13 24 10.753	+ 9 02 31.18	31.273251	0.28	12 38 13
	7	13 26 09.142	+ 8 50 09.05	13 24 44.405	+ 8 58 53.66	31.276583	0.28	12 23 03
	11	13 26 43.137	+ 8 46 38.93	13 25 18.373	+ 8 55 23.59	31.275580	0.28	12 07 53
	15	13 27 17.306	+ 8 43 17.11	13 25 52.535	+ 8 52 01.70	31.270248	0.28	11 52 43
	19	13 27 51.564	+ 8 40 04.19	13 26 26.780	+ 8 48 48.68	31.260605	0.28	11 37 34
	23	13 28 25.818	+ 8 37 00.64	13 27 00.995	+ 8 45 45.22	31.246666	0.28	11 22 24
	27	13 28 59.919	+ 8 34 07.35	13 27 35.063	+ 8 42 52.02	31.228453	0.28	11 07 15
	31	13 29 33.737	+ 8 31 25.12	13 28 08.857	+ 8 40 09.78	31.206011	0.28	10 52 04
NOV	4	13 30 07.181	+ 8 28 54.38	13 28 42.248	+ 8 37 39.18	31.179411	0.28	10 36 54
	8	13 30 40.107	+ 8 26 35.71	13 29 15.104	+ 8 35 20.81	31.148764	0.28	10 21 43
	12	13 31 12.354	+ 8 24 29.93	13 29 47.304	+ 8 33 15.17	31.114212	0.28	10 06 31
	16	13 31 43.847	+ 8 22 37.26	13 30 18.735	+ 8 31 22.69	31.075902	0.28	9 51 19
	20	13 32 14.484	+ 8 20 58.00	13 30 49.287	+ 8 29 43.80	31.033981	0.28	9 36 06
	24	13 32 44.120	+ 8 19 32.75	13 31 18.847	+ 8 28 18.88	30.988606	0.28	9 20 51
	28	13 33 12.640	+ 8 18 21.94	13 31 47.299	+ 8 27 08.33	30.939951	0.28	9 05 36
DEC	2	13 33 39.967	+ 8 17 25.62	13 32 14.524	+ 8 26 12.46	30.888221	0.28	8 50 20
	6	13 34 05.959	+ 8 16 44.10	13 32 40.407	+ 8 25 31.49	30.833658	0.29	8 35 02
	10	13 34 30.485	+ 8 16 17.74	13 33 04.849	+ 8 25 05.52	30.776526	0.29	8 19 42
	14	13 34 53.502	+ 8 16 06.32	13 33 27.762	+ 8 24 54.56	30.717089	0.29	8 04 21
	18	13 35 14.921	+ 8 16 09.76	13 33 49.063	+ 8 24 58.61	30.655604	0.29	7 48 59
	22	13 35 34.632	+ 8 16 28.22	13 34 08.671	+ 8 25 17.61	30.592336	0.29	7 33 35
	26	13 35 52.563	+ 8 17 01.60	13 34 26.504	+ 8 25 51.48	30.527563	0.29	7 18 09
	30	13 36 08.674	+ 8 17 49.47	13 34 42.484	+ 8 26 40.03	30.461586	0.29	7 02 41

GEOCENTRIC POSITIONS OF PLUTO FOR 0H ET

--- 1979 ---

DATE		RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
		H M S	D ' ''	H M S	D ' ''	AU	''	H M S
JAN	3	13 36 22.857	+ 8 18 51.69	13 34 56.540	+ 8 27 42.97	30.394732	0.29	6 47 11
	7	13 36 35.043	+ 8 20 08.05	13 35 08.625	+ 8 28 59.86	30.327344	0.29	6 31 40
	11	13 36 45.243	+ 8 21 37.76	13 35 18.704	+ 8 30 30.20	30.259748	0.29	6 16 06
	15	13 36 53.416	+ 8 23 20.28	13 35 26.750	+ 8 32 13.45	30.192255	0.29	6 00 31
	19	13 36 59.511	+ 8 25 15.24	13 35 32.741	+ 8 34 09.02	30.125174	0.29	5 44 53
	23	13 37 03.531	+ 8 27 21.95	13 35 36.658	+ 8 36 16.29	30.058819	0.29	5 29 13
	27	13 37 05.495	+ 8 29 39.46	13 35 38.490	+ 8 38 34.54	29.993513	0.29	5 13 31
	31	13 37 05.358	+ 8 32 07.15	13 35 38.239	+ 8 41 02.94	29.929597	0.29	4 57 48
FEB	4	13 37 03.142	+ 8 34 44.23	13 35 35.930	+ 8 43 40.54	29.867407	0.29	4 42 01
	8	13 36 58.929	+ 8 37 29.41	13 35 31.605	+ 8 46 26.34	29.807247	0.30	4 26 14
	12	13 36 52.742	+ 8 40 21.75	13 35 25.313	+ 8 49 19.33	29.749398	0.30	4 10 24
	16	13 36 44.617	+ 8 43 20.42	13 35 17.106	+ 8 52 18.50	29.694125	0.30	3 54 32
	20	13 36 34.639	+ 8 46 24.27	13 35 07.045	+ 8 55 22.81	29.641688	0.30	3 38 38
	24	13 36 22.897	+ 8 49 31.98	13 34 55.196	+ 8 58 31.15	29.592347	0.30	3 22 43
	28	13 36 09.421	+ 8 52 42.67	13 34 41.639	+ 9 01 42.35	29.546361	0.30	3 06 46
MAR	4	13 35 54.325	+ 8 55 55.13	13 34 26.478	+ 9 04 55.17	29.503971	0.30	2 50 47
	8	13 35 37.759	+ 8 59 07.85	13 34 09.829	+ 9 08 08.35	29.465377	0.30	2 34 47
	12	13 35 19.811	+ 9 02 19.78	13 33 51.811	+ 9 11 20.70	29.430743	0.30	2 18 45
	16	13 35 00.591	+ 9 05 29.90	13 33 32.546	+ 9 14 31.08	29.400210	0.30	2 02 43
	20	13 34 40.255	+ 9 08 36.91	13 33 12.156	+ 9 17 38.35	29.373910	0.30	1 46 39
	24	13 34 18.938	+ 9 11 39.54	13 32 50.769	+ 9 20 41.38	29.351963	0.30	1 30 34
	28	13 33 56.730	+ 9 14 36.92	13 32 28.522	+ 9 23 38.99	29.334486	0.30	1 14 28
APR	1	13 33 33.812	+ 9 17 27.84	13 32 05.570	+ 9 26 30.03	29.321564	0.30	0 58 22
	5	13 33 10.364	+ 9 20 10.96	13 31 42.073	+ 9 29 13.39	29.313233	0.30	0 42 15
	9	13 32 46.510	+ 9 22 45.48	13 31 18.188	+ 9 31 48.08	29.309498	0.30	0 26 07
	13	13 32 22.398	+ 9 25 10.60	13 30 54.066	+ 9 34 13.20	29.310338	0.30	0 10 00
	17	13 31 58.211	+ 9 27 25.26	13 30 29.854	+ 9 36 27.90	29.315722	0.30	23 49 50
	21	13 31 34.087	+ 9 29 28.58	13 30 05.695	+ 9 38 31.40	29.325612	0.30	23 33 42
	25	13 31 10.137	+ 9 31 20.11	13 29 41.742	+ 9 40 22.89	29.339959	0.30	23 17 35
	29	13 30 46.555	+ 9 32 58.93	13 29 18.154	+ 9 42 01.63	29.358685	0.30	23 01 28
MAY	3	13 30 23.508	+ 9 34 24.24	13 28 55.088	+ 9 43 26.99	29.381666	0.30	22 45 22
	7	13 30 01.105	+ 9 35 35.79	13 28 32.688	+ 9 44 38.47	29.408749	0.30	22 29 16
	11	13 29 39.487	+ 9 36 33.22	13 28 11.088	+ 9 45 35.69	29.439767	0.30	22 13 11
	15	13 29 18.815	+ 9 37 15.95	13 27 50.410	+ 9 46 18.34	29.474548	0.30	21 57 07
	19	13 28 59.184	+ 9 37 43.78	13 27 30.773	+ 9 46 46.16	29.512919	0.30	21 41 04
	23	13 28 40.681	+ 9 37 56.75	13 27 12.296	+ 9 46 58.89	29.554703	0.30	21 25 03
	27	13 28 23.471	+ 9 37 54.43	13 26 55.099	+ 9 46 56.37	29.599693	0.30	21 09 02
	31	13 28 07.662	+ 9 37 36.69	13 26 39.294	+ 9 46 38.53	29.647646	0.30	20 53 03
JUNE	4	13 27 53.317	+ 9 37 03.83	13 26 24.978	+ 9 46 05.44	29.698305	0.30	20 37 06
	8	13 27 40.534	+ 9 36 15.99	13 26 12.231	+ 9 45 17.28	29.751405	0.30	20 21 09
	12	13 27 29.415	+ 9 35 13.14	13 26 01.121	+ 9 44 14.27	29.806687	0.30	20 05 15
	16	13 27 19.987	+ 9 33 55.67	13 25 51.710	+ 9 42 56.65	29.863903	0.29	19 49 22
	20	13 27 12.293	+ 9 32 24.06	13 25 44.060	+ 9 41 24.69	29.922802	0.29	19 33 32
	24	13 27 06.440	+ 9 30 38.34	13 25 38.231	+ 9 39 38.70	29.983109	0.29	19 17 42
	28	13 27 02.460	+ 9 28 38.94	13 25 34.273	+ 9 37 39.11	30.044529	0.29	19 01 55

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DATE		RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
		H M S	D ' "	H M S	O ' "	AU	"	H M S
JULY	2	13 27 00.359	+ 9 26 26.59	13 25 32.218	+ 9 35 26.43	30.106757	0.29	18 46 10
	6	13 27 00.177	+ 9 24 01.80	13 25 32.082	+ 9 33 01.24	30.169497	0.29	18 30 26
	10	13 27 01.949	+ 9 21 24.93	13 25 33.871	+ 9 30 24.18	30.232463	0.29	18 14 45
	14	13 27 05.631	+ 9 18 36.84	13 25 37.586	+ 9 27 35.84	30.295392	0.29	17 59 05
	18	13 27 11.223	+ 9 15 38.24	13 25 43.230	+ 9 24 36.82	30.358021	0.29	17 43 27
	22	13 27 18.765	+ 9 12 29.48	13 25 50.802	+ 9 21 27.77	30.420069	0.29	17 27 52
	26	13 27 28.220	+ 9 09 11.38	13 26 00.290	+ 9 18 09.41	30.481243	0.29	17 12 18
	30	13 27 39.543	+ 9 05 44.90	13 26 11.667	+ 9 14 42.53	30.541251	0.29	16 56 46
AUG	3	13 27 52.722	+ 9 02 10.74	13 26 24.893	+ 9 11 07.96	30.599819	0.29	16 41 16
	7	13 28 07.729	+ 8 58 29.52	13 26 39.920	+ 9 07 26.52	30.656692	0.29	16 25 47
	11	13 28 24.465	+ 8 54 42.33	13 26 56.695	+ 9 03 39.02	30.711639	0.29	16 10 21
	15	13 28 42.894	+ 8 50 49.98	13 27 15.173	+ 8 59 46.23	30.764438	0.29	15 54 55
	19	13 29 02.999	+ 8 46 52.98	13 27 35.304	+ 8 55 48.95	30.814848	0.29	15 39 32
	23	13 29 24.688	+ 8 42 52.37	13 27 57.026	+ 8 51 48.05	30.862627	0.28	15 24 10
	27	13 29 47.878	+ 8 38 49.18	13 28 20.266	+ 8 47 44.44	30.907545	0.28	15 08 50
	31	13 30 12.517	+ 8 34 44.16	13 28 44.941	+ 8 43 39.03	30.949392	0.28	14 53 31
SEPT	4	13 30 38.527	+ 8 30 38.05	13 29 10.960	+ 8 39 32.73	30.987985	0.28	14 38 14
	8	13 31 05.769	+ 8 26 32.03	13 29 38.235	+ 8 35 26.40	31.023170	0.28	14 22 57
	12	13 31 34.185	+ 8 22 26.85	13 30 06.681	+ 8 31 20.84	31.054801	0.28	14 07 42
	16	13 32 03.711	+ 8 18 23.11	13 30 36.214	+ 8 27 16.89	31.082721	0.28	13 52 28
	20	13 32 34.216	+ 8 14 21.92	13 31 06.738	+ 8 23 15.44	31.106775	0.28	13 37 15
	24	13 33 05.595	+ 8 10 24.24	13 31 38.146	+ 8 19 17.40	31.126829	0.28	13 22 02
	28	13 33 37.767	+ 8 06 30.75	13 32 10.324	+ 8 15 23.65	31.142776	0.28	13 06 51
OCT	2	13 34 10.613	+ 8 02 42.25	13 32 43.155	+ 8 11 35.05	31.154538	0.28	12 51 40
	6	13 34 43.975	+ 7 58 59.85	13 33 16.525	+ 8 07 52.41	31.162071	0.28	12 36 30
	10	13 35 17.783	+ 7 55 24.12	13 33 50.328	+ 8 04 16.47	31.165335	0.28	12 21 20
	14	13 35 51.938	+ 7 51 55.68	13 34 24.455	+ 8 00 47.97	31.164288	0.28	12 06 10
	18	13 36 26.285	+ 7 48 35.53	13 34 58.790	+ 7 57 27.71	31.158894	0.28	11 51 01
	22	13 37 00.711	+ 7 45 24.48	13 35 33.208	+ 7 54 16.47	31.149142	0.28	11 35 51
	26	13 37 35.121	+ 7 42 23.04	13 36 07.578	+ 7 51 15.01	31.135052	0.28	11 20 42
	30	13 38 09.365	+ 7 39 31.93	13 36 41.770	+ 7 48 24.01	31.116679	0.28	11 05 32
NOV	3	13 38 43.287	+ 7 36 52.05	13 37 15.661	+ 7 45 44.09	31.094106	0.28	10 50 22
	7	13 39 16.817	+ 7 34 23.71	13 37 49.137	+ 7 43 15.80	31.067426	0.28	10 35 12
	11	13 39 49.835	+ 7 32 07.37	13 38 22.083	+ 7 40 59.66	31.036724	0.28	10 20 01
	15	13 40 22.185	+ 7 30 03.83	13 38 54.379	+ 7 38 56.24	31.002101	0.28	10 04 49
	19	13 40 53.760	+ 7 28 13.56	13 39 25.898	+ 7 37 06.06	30.963681	0.28	9 49 37
	23	13 41 24.465	+ 7 26 36.80	13 39 56.514	+ 7 35 29.58	30.921621	0.28	9 34 24
	27	13 41 54.145	+ 7 25 14.04	13 40 26.102	+ 7 34 07.18	30.876113	0.28	9 19 10
DEC	1	13 42 22.666	+ 7 24 05.78	13 40 54.551	+ 7 32 59.14	30.827372	0.29	9 03 54
	5	13 42 49.976	+ 7 23 11.93	13 41 21.760	+ 7 32 05.64	30.775616	0.29	8 48 38
	9	13 43 15.956	+ 7 22 32.67	13 41 47.632	+ 7 31 26.86	30.721057	0.29	8 33 20
	13	13 43 40.477	+ 7 22 08.39	13 42 12.064	+ 7 31 02.96	30.663917	0.29	8 18 00
	17	13 44 03.463	+ 7 21 59.11	13 42 34.955	+ 7 30 54.04	30.604442	0.29	8 02 39
	21	13 44 24.841	+ 7 22 04.62	13 42 56.207	+ 7 31 00.13	30.542905	0.29	7 47 17
	25	13 44 44.479	+ 7 22 25.04	13 43 15.729	+ 7 31 21.14	30.479607	0.29	7 31 53
	29	13 45 02.297	+ 7 23 00.31	13 43 33.448	+ 7 31 56.85	30.414863	0.29	7 16 27

GEOCENTRIC POSITIONS OF PLUTO FOR OH ET

--- 1980 ---

DATE		RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
		H M S	O ' ''	H M S	O ' ''	AU	''	H M S
JAN	2	13 45 18.282	+ 7 23 49.83	13 43 49.306	+ 7 32 46.96	30.348981	0.29	7 00 59
	6	13 45 32.349	+ 7 24 53.37	13 44 03.249	+ 7 33 51.17	30.282253	0.29	6 45 29
	10	13 45 44.426	+ 7 26 10.77	13 44 15.225	+ 7 35 09.11	30.214980	0.29	6 29 57
	14	13 45 54.494	+ 7 27 41.49	13 44 25.183	+ 7 36 40.36	30.147473	0.29	6 14 24
	18	13 46 02.529	+ 7 29 24.80	13 44 33.084	+ 7 38 24.41	30.080063	0.29	5 58 48
	22	13 46 08.458	+ 7 31 20.35	13 44 38.899	+ 7 40 20.63	30.013096	0.29	5 43 10
	26	13 46 12.282	+ 7 33 27.46	13 44 42.622	+ 7 42 28.27	29.946919	0.29	5 27 30
	30	13 46 14.046	+ 7 35 45.01	13 44 44.262	+ 7 44 46.52	29.881852	0.29	5 11 48
FEB	3	13 46 13.731	+ 7 38 12.35	13 44 43.836	+ 7 47 14.54	29.818198	0.29	4 56 04
	7	13 46 11.346	+ 7 40 48.77	13 44 41.363	+ 7 49 51.49	29.756249	0.30	4 40 18
	11	13 46 06.948	+ 7 43 33.20	13 44 36.868	+ 7 52 36.46	29.696302	0.30	4 24 30
	15	13 46 00.584	+ 7 46 24.50	13 44 30.387	+ 7 55 28.47	29.638658	0.30	4 08 40
	19	13 45 52.256	+ 7 49 21.92	13 44 21.972	+ 7 58 26.47	29.583621	0.30	3 52 48
	23	13 45 42.061	+ 7 52 24.27	13 44 11.696	+ 8 01 29.29	29.531479	0.30	3 36 54
	27	13 45 30.111	+ 7 55 30.13	13 43 59.647	+ 8 04 35.75	29.482479	0.30	3 20 58
MAR	2	13 45 16.459	+ 7 58 38.56	13 43 45.917	+ 8 07 44.72	29.436838	0.30	3 05 01
	6	13 45 01.199	+ 8 01 48.55	13 43 30.600	+ 8 10 55.07	29.394761	0.30	2 49 02
	10	13 44 44.464	+ 8 04 58.73	13 43 13.796	+ 8 14 05.66	29.356440	0.30	2 33 02
	14	13 44 26.362	+ 8 08 07.86	13 42 55.611	+ 8 17 15.33	29.322067	0.30	2 17 00
	18	13 44 06.966	+ 8 11 15.05	13 42 36.166	+ 8 20 22.87	29.291821	0.30	2 00 57
	22	13 43 46.455	+ 8 14 18.93	13 42 15.602	+ 8 23 27.04	29.265855	0.30	1 44 53
	26	13 43 24.984	+ 8 17 18.13	13 41 54.067	+ 8 26 26.66	29.244273	0.30	1 28 48
	30	13 43 02.659	+ 8 20 11.81	13 41 31.704	+ 8 29 20.62	29.227145	0.30	1 12 42
APR	3	13 42 39.634	+ 8 22 58.95	13 41 08.657	+ 8 32 07.89	29.214523	0.30	0 56 36
	7	13 42 16.085	+ 8 25 38.33	13 40 45.067	+ 8 34 47.49	29.206449	0.30	0 40 29
	11	13 41 52.143	+ 8 28 08.97	13 40 21.080	+ 8 37 18.44	29.202954	0.30	0 24 21
	15	13 41 27.924	+ 8 30 30.20	13 39 56.849	+ 8 39 39.77	29.204058	0.30	0 08 14
	19	13 41 03.640	+ 8 32 40.86	13 39 32.540	+ 8 41 50.53	29.209746	0.30	23 48 04
	23	13 40 39.448	+ 8 34 40.02	13 39 08.315	+ 8 43 49.89	29.219955	0.30	23 31 56
	27	13 40 15.465	+ 8 36 27.25	13 38 44.330	+ 8 45 37.16	29.234592	0.30	23 15 49
MAY	1	13 39 51.857	+ 8 38 01.89	13 38 20.728	+ 8 47 11.72	29.253552	0.30	22 59 42
	5	13 39 28.793	+ 8 39 23.15	13 37 57.646	+ 8 48 33.04	29.276722	0.30	22 43 35
	9	13 39 06.380	+ 8 40 30.64	13 37 35.221	+ 8 49 40.62	29.303984	0.30	22 27 30
	13	13 38 44.735	+ 8 41 24.14	13 37 13.592	+ 8 50 33.99	29.335207	0.30	22 11 25
	17	13 38 24.048	+ 8 42 02.93	13 36 52.901	+ 8 51 12.73	29.370231	0.30	21 55 21
	21	13 38 04.434	+ 8 42 26.76	13 36 33.282	+ 8 51 36.58	29.408852	0.30	21 39 18
	25	13 37 45.980	+ 8 42 35.73	13 36 14.853	+ 8 51 45.39	29.450848	0.30	21 23 16
	29	13 37 28.820	+ 8 42 29.67	13 35 57.717	+ 8 51 39.11	29.495994	0.30	21 07 16
JUNE	2	13 37 13.071	+ 8 42 08.37	13 35 41.968	+ 8 51 17.74	29.544066	0.30	20 51 17
	6	13 36 58.786	+ 8 41 32.07	13 35 27.697	+ 8 50 41.35	29.594842	0.30	20 35 19
	10	13 36 46.044	+ 8 40 40.99	13 35 14.991	+ 8 49 50.00	29.648093	0.30	20 19 23
	14	13 36 34.983	+ 8 39 34.95	13 35 03.940	+ 8 48 43.80	29.703563	0.30	20 03 29
	18	13 36 25.645	+ 8 38 14.30	13 34 54.618	+ 8 47 23.03	29.760968	0.30	19 47 36
	22	13 36 18.066	+ 8 36 39.62	13 34 47.083	+ 8 45 48.04	29.820016	0.29	19 31 45
	26	13 36 12.325	+ 8 34 51.17	13 34 41.377	+ 8 43 59.27	29.880420	0.29	19 15 57
	30	13 36 08.468	+ 8 32 49.22	13 34 37.533	+ 8 41 57.18	29.941905	0.29	19 00 09

GEOCENTRIC POSITIONS OF PLUTO FOR OH ET

--- 1980 ---

DATE		RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
		H M S	O ' ''	H M S	O ' ''	AU	''	H M S
JULY	4	13 36 06.480	+ 8 30 34.53	13 34 35.578	+ 8 39 42.25	30.004208	0.29	18 44 24
	8	13 36 06.399	+ 8 28 07.62	13 34 35.543	+ 8 37 14.95	30.067062	0.29	18 28 41
	12	13 36 08.288	+ 8 25 28.71	13 34 37.450	+ 8 34 35.82	30.130179	0.29	18 12 59
	16	13 36 12.119	+ 8 22 38.62	13 34 41.313	+ 8 31 45.49	30.193253	0.29	17 57 20
	20	13 36 17.877	+ 8 19 38.20	13 34 47.125	+ 8 28 44.65	30.255983	0.29	17 41 42
	24	13 36 25.580	+ 8 16 27.98	13 34 54.868	+ 8 25 34.05	30.318082	0.29	17 26 07
	28	13 36 35.209	+ 8 13 08.60	13 35 04.515	+ 8 22 14.46	30.379282	0.29	17 10 33
AUG	1	13 36 46.688	+ 8 09 41.07	13 35 16.039	+ 8 18 46.59	30.439332	0.29	16 55 01
	5	13 37 00.015	+ 8 06 06.08	13 35 29.412	+ 8 15 11.16	30.497983	0.29	16 39 31
	9	13 37 15.187	+ 8 02 24.12	13 35 44.604	+ 8 11 28.93	30.554968	0.29	16 24 03
	13	13 37 32.117	+ 7 58 36.25	13 36 01.572	+ 8 07 40.72	30.610015	0.29	16 08 37
	17	13 37 50.748	+ 7 54 43.43	13 36 20.257	+ 8 03 47.42	30.662863	0.29	15 53 12
	21	13 38 11.051	+ 7 50 46.33	13 36 40.592	+ 7 59 49.93	30.713275	0.29	15 37 48
	25	13 38 32.947	+ 7 46 45.76	13 37 02.504	+ 7 55 49.11	30.761034	0.29	15 22 27
	29	13 38 56.320	+ 7 42 42.87	13 37 25.919	+ 7 51 45.81	30.805951	0.29	15 07 07
SEPT	2	13 39 21.139	+ 7 38 38.32	13 37 50.768	+ 7 47 40.83	30.847836	0.29	14 51 48
	6	13 39 47.341	+ 7 34 32.76	13 38 16.980	+ 7 43 35.01	30.886490	0.28	14 36 31
	10	13 40 14.799	+ 7 30 27.36	13 38 44.468	+ 7 39 29.25	30.921714	0.28	14 21 14
	14	13 40 43.431	+ 7 26 23.04	13 39 13.137	+ 7 35 24.46	30.953329	0.28	14 06 00
	18	13 41 13.166	+ 7 22 20.49	13 39 42.883	+ 7 31 21.56	30.981185	0.28	13 50 46
	22	13 41 43.883	+ 7 18 20.57	13 40 13.598	+ 7 27 21.44	31.005160	0.28	13 35 33
	26	13 42 15.442	+ 7 14 24.42	13 40 45.179	+ 7 23 24.91	31.025158	0.28	13 20 20
	30	13 42 47.793	+ 7 10 32.58	13 41 17.528	+ 7 19 32.75	31.041087	0.28	13 05 09
OCT	4	13 43 20.824	+ 7 06 45.77	13 41 50.543	+ 7 15 45.76	31.052848	0.28	12 49 58
	8	13 43 54.388	+ 7 03 05.10	13 42 24.112	+ 7 12 04.80	31.060350	0.28	12 34 48
	12	13 44 28.387	+ 6 59 31.35	13 42 58.113	+ 7 08 30.70	31.063531	0.28	12 19 39
	16	13 45 02.722	+ 6 56 05.11	13 43 32.420	+ 7 05 04.30	31.062358	0.28	12 04 29
	20	13 45 37.242	+ 6 52 47.22	13 44 06.907	+ 7 01 46.34	31.056832	0.28	11 49 20
	24	13 46 11.803	+ 6 49 38.63	13 44 41.453	+ 6 58 37.52	31.046979	0.28	11 34 11
	28	13 46 46.342	+ 6 46 39.67	13 45 15.945	+ 6 55 38.47	31.032830	0.28	11 19 01
NOV	1	13 47 20.720	+ 6 43 51.00	13 45 50.267	+ 6 52 49.84	31.014413	0.28	11 03 52
	5	13 47 54.782	+ 6 41 13.55	13 46 24.295	+ 6 50 12.30	30.991769	0.28	10 48 42
	9	13 48 28.431	+ 6 38 47.82	13 46 57.898	+ 6 47 46.48	30.964970	0.28	10 33 32
	13	13 49 01.553	+ 6 36 34.21	13 47 30.945	+ 6 45 32.98	30.934120	0.28	10 18 21
	17	13 49 33.988	+ 6 34 33.37	13 48 03.306	+ 6 43 32.31	30.899357	0.28	10 03 09
	21	13 50 05.605	+ 6 32 45.90	13 48 34.864	+ 6 41 44.87	30.860841	0.29	9 47 57
	25	13 50 36.347	+ 6 31 11.83	13 49 05.509	+ 6 40 11.02	30.818737	0.29	9 32 44
	29	13 51 06.064	+ 6 29 51.59	13 49 35.132	+ 6 38 51.09	30.773203	0.29	9 17 30
DEC	3	13 51 34.623	+ 6 28 45.75	13 50 03.616	+ 6 37 45.42	30.724413	0.29	9 02 15
	7	13 52 01.942	+ 6 27 54.41	13 50 30.844	+ 6 36 54.30	30.672572	0.29	8 46 58
	11	13 52 27.917	+ 6 27 17.61	13 50 56.703	+ 6 36 17.93	30.617913	0.29	8 31 40
	15	13 52 52.404	+ 6 26 55.67	13 51 21.087	+ 6 35 56.41	30.560699	0.29	8 16 21
	19	13 53 15.315	+ 6 26 48.69	13 51 43.903	+ 6 35 49.73	30.501209	0.29	8 01 00
	23	13 53 36.614	+ 6 26 56.23	13 52 05.073	+ 6 35 57.79	30.439714	0.29	7 45 37
	27	13 53 56.178	+ 6 27 18.37	13 52 24.519	+ 6 36 20.49	30.376480	0.29	7 30 13
	31	13 54 13.919	+ 6 27 55.17	13 52 42.163	+ 6 36 57.69	30.311781	0.29	7 14 47

GEOCENTRIC POSITIONS OF PLUTO FOR OH ET

--- 1981 ---

DATE		RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
		H M S	D ' ''	H M S	O ' ''	AU	''	H M S
JAN	4	13 54 29.799	+ 6 28 46.19	13 52 57.928	+ 6 37 49.19	30.245916	0.29	6 59 19
	8	13 54 43.753	+ 6 29 51.02	13 53 11.748	+ 6 38 54.69	30.179204	0.29	6 43 49
	12	13 54 55.682	+ 6 31 09.50	13 53 23.568	+ 6 40 13.75	30.111984	0.29	6 28 17
	16	13 55 05.574	+ 6 32 41.11	13 53 33.353	+ 6 41 45.85	30.044595	0.29	6 12 43
	20	13 55 13.437	+ 6 34 24.93	13 53 41.081	+ 6 43 30.38	29.977361	0.29	5 57 07
	24	13 55 19.205	+ 6 36 20.59	13 53 46.736	+ 6 45 26.70	29.910586	0.29	5 41 29
	28	13 55 22.867	+ 6 38 27.55	13 53 50.304	+ 6 47 34.17	29.844578	0.29	5 25 49
FEB	1	13 55 24.453	+ 6 40 44.86	13 53 51.778	+ 6 49 52.07	29.779654	0.30	5 10 07
	5	13 55 23.957	+ 6 43 11.63	13 53 51.160	+ 6 52 19.58	29.716144	0.30	4 54 22
	9	13 55 21.361	+ 6 45 47.25	13 53 48.473	+ 6 54 55.79	29.654380	0.30	4 38 36
	13	13 55 16.741	+ 6 48 30.61	13 53 43.757	+ 6 57 39.68	29.594680	0.30	4 22 48
	17	13 55 10.168	+ 6 51 20.43	13 53 37.070	+ 7 00 30.21	29.537329	0.30	4 06 58
	21	13 55 01.652	+ 6 54 15.96	13 53 28.470	+ 7 03 26.33	29.482587	0.30	3 51 05
	25	13 54 51.273	+ 6 57 16.21	13 53 18.021	+ 7 06 27.03	29.430705	0.30	3 35 11
MAR	1	13 54 39.134	+ 7 00 19.86	13 53 05.793	+ 7 09 31.23	29.381933	0.30	3 19 16
	5	13 54 25.299	+ 7 03 25.79	13 52 51.868	+ 7 12 37.79	29.336520	0.30	3 03 18
	9	13 54 09.832	+ 7 06 33.09	13 52 36.343	+ 7 15 45.54	29.294705	0.30	2 47 19
	13	13 53 52.897	+ 7 09 40.34	13 52 19.337	+ 7 18 53.22	29.256698	0.30	2 31 18
	17	13 53 34.615	+ 7 12 46.18	13 52 00.976	+ 7 21 59.63	29.222668	0.30	2 15 17
	21	13 53 15.069	+ 7 15 49.80	13 51 41.385	+ 7 25 03.64	29.192747	0.30	1 59 14
	25	13 52 54.413	+ 7 18 50.02	13 51 20.690	+ 7 28 04.14	29.167059	0.30	1 43 09
	29	13 52 32.802	+ 7 21 45.54	13 50 59.021	+ 7 31 00.06	29.145717	0.30	1 27 04
APR	2	13 52 10.347	+ 7 24 35.34	13 50 36.514	+ 7 33 50.29	29.128825	0.30	1 10 58
	6	13 51 47.174	+ 7 27 18.58	13 50 13.318	+ 7 36 33.75	29.116469	0.30	0 54 51
	10	13 51 23.494	+ 7 29 53.88	13 49 49.593	+ 7 39 09.32	29.108704	0.30	0 38 44
	14	13 50 59.447	+ 7 32 20.22	13 49 25.503	+ 7 41 36.03	29.105530	0.30	0 22 37
	18	13 50 35.155	+ 7 34 37.05	13 49 01.202	+ 7 43 53.00	29.106922	0.30	0 06 29
	22	13 50 10.800	+ 7 36 43.40	13 48 36.837	+ 7 45 59.44	29.112843	0.30	23 46 19
	26	13 49 46.547	+ 7 38 38.34	13 48 12.554	+ 7 47 54.59	29.123247	0.30	23 30 12
	30	13 49 22.512	+ 7 40 21.29	13 47 48.500	+ 7 49 37.75	29.138078	0.30	23 14 04
MAY	4	13 48 58.834	+ 7 41 51.78	13 47 24.829	+ 7 51 08.23	29.157263	0.30	22 57 57
	8	13 48 35.725	+ 7 43 08.81	13 47 01.697	+ 7 52 25.39	29.180695	0.30	22 41 50
	12	13 48 13.296	+ 7 44 12.00	13 46 39.256	+ 7 53 28.74	29.208220	0.30	22 25 45
	16	13 47 51.661	+ 7 45 01.24	13 46 17.640	+ 7 54 17.91	29.239666	0.30	22 09 40
	20	13 47 30.985	+ 7 45 36.04	13 45 56.972	+ 7 54 52.63	29.274856	0.30	21 53 36
	24	13 47 11.391	+ 7 45 56.04	13 45 37.371	+ 7 55 12.69	29.313612	0.30	21 37 33
	28	13 46 52.959	+ 7 46 01.26	13 45 18.949	+ 7 55 17.91	29.355751	0.30	21 21 31
JUNE	1	13 46 35.805	+ 7 45 51.68	13 45 01.822	+ 7 55 08.14	29.401076	0.30	21 05 31
	5	13 46 20.093	+ 7 45 26.85	13 44 46.103	+ 7 54 43.31	29.449361	0.30	20 49 32
	9	13 46 05.871	+ 7 44 47.05	13 44 31.893	+ 7 54 03.47	29.500347	0.30	20 33 35
	13	13 45 53.214	+ 7 43 52.64	13 44 19.274	+ 7 53 08.82	29.553762	0.30	20 17 38
	17	13 45 42.233	+ 7 42 43.61	13 44 08.315	+ 7 51 59.59	29.609345	0.30	20 01 44
	21	13 45 32.985	+ 7 41 20.18	13 43 59.076	+ 7 50 36.08	29.666841	0.30	19 45 52
	25	13 45 25.490	+ 7 39 42.90	13 43 51.613	+ 7 48 58.60	29.725995	0.30	19 30 01
	29	13 45 19.822	+ 7 37 52.09	13 43 45.983	+ 7 47 07.48	29.786547	0.30	19 14 12

--- 1981 ---

DATE	RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
	H M S	O ' ''	H M S	O ' ''	AU	''	H M S
JULY 3	13 45 16.070	+ 7 35 47.82	13 43 42.236	+ 7 45 03.10	29.848213	0.29	18 58 25
7	13 45 14.212	+ 7 33 30.88	13 43 40.410	+ 7 42 45.96	29.910686	0.29	18 42 40
11	13 45 14.275	+ 7 31 01.97	13 43 40.522	+ 7 40 16.66	29.973662	0.29	18 26 57
15	13 45 16.303	+ 7 28 21.44	13 43 42.578	+ 7 37 35.83	30.036854	0.29	18 11 16
19	13 45 20.282	+ 7 25 29.92	13 43 46.577	+ 7 34 44.11	30.099988	0.29	17 55 36
23	13 45 26.174	+ 7 22 28.30	13 43 52.516	+ 7 31 42.15	30.162800	0.29	17 39 59
27	13 45 34.008	+ 7 19 17.13	13 44 00.390	+ 7 28 30.56	30.225024	0.29	17 24 23
31	13 45 43.797	+ 7 15 56.82	13 44 10.191	+ 7 25 10.05	30.286376	0.29	17 08 50
AUG 4	13 45 55.459	+ 7 12 28.49	13 44 21.896	+ 7 21 41.36	30.346559	0.29	16 53 18
8	13 46 08.977	+ 7 08 52.96	13 44 35.464	+ 7 18 05.34	30.405291	0.29	16 37 48
12	13 46 24.334	+ 7 05 10.82	13 44 50.847	+ 7 14 22.84	30.462312	0.29	16 22 20
16	13 46 41.455	+ 7 01 22.94	13 45 07.991	+ 7 10 34.67	30.517385	0.29	16 06 54
20	13 47 00.258	+ 6 57 30.39	13 45 26.843	+ 7 06 41.65	30.570283	0.29	15 51 29
24	13 47 20.734	+ 6 53 33.73	13 45 47.348	+ 7 02 44.54	30.620785	0.29	15 36 06
28	13 47 42.827	+ 6 49 33.63	13 46 09.452	+ 6 58 44.17	30.668653	0.29	15 20 45
SEPT 1	13 48 06.418	+ 6 45 31.32	13 46 33.082	+ 6 54 41.42	30.713650	0.29	15 05 25
5	13 48 31.451	+ 6 41 27.66	13 46 58.154	+ 6 50 37.23	30.755559	0.29	14 50 06
9	13 48 57.863	+ 6 37 23.29	13 47 24.577	+ 6 46 32.49	30.794194	0.29	14 34 49
13	13 49 25.532	+ 6 33 19.21	13 47 52.258	+ 6 42 28.09	30.829390	0.29	14 19 33
17	13 49 54.347	+ 6 29 16.48	13 48 21.106	+ 6 38 24.86	30.861006	0.29	14 04 18
21	13 50 24.272	+ 6 25 15.61	13 48 51.034	+ 6 34 23.59	30.888899	0.28	13 49 05
25	13 50 55.194	+ 6 21 17.40	13 49 21.949	+ 6 30 25.13	30.912920	0.28	13 33 52
29	13 51 26.971	+ 6 17 23.05	13 49 53.745	+ 6 26 30.34	30.932928	0.28	13 18 40
OCT 3	13 51 59.526	+ 6 13 33.29	13 50 26.309	+ 6 22 40.12	30.948809	0.28	13 03 29
7	13 52 32.757	+ 6 09 48.79	13 50 59.519	+ 6 18 55.34	30.960484	0.28	12 48 18
11	13 53 06.510	+ 6 06 10.50	13 51 33.259	+ 6 15 16.81	30.967900	0.28	12 33 09
15	13 53 40.665	+ 6 02 39.36	13 52 07.412	+ 6 11 45.26	30.971025	0.28	12 17 59
19	13 54 15.163	+ 5 59 15.72	13 52 41.871	+ 6 08 21.40	30.969834	0.28	12 02 50
23	13 54 49.851	+ 5 56 00.40	13 53 16.520	+ 6 05 05.95	30.964294	0.28	11 47 41
27	13 55 24.584	+ 5 52 54.42	13 53 51.237	+ 6 01 59.68	30.954390	0.28	11 32 31
31	13 55 59.273	+ 5 49 58.30	13 54 25.888	+ 5 59 03.32	30.940137	0.28	11 17 22
NOV 4	13 56 33.791	+ 5 47 12.59	13 55 00.343	+ 5 56 17.55	30.921588	0.28	11 02 13
8	13 57 07.972	+ 5 44 38.08	13 55 34.472	+ 5 53 42.99	30.898822	0.28	10 47 03
12	13 57 41.700	+ 5 42 15.43	13 56 08.153	+ 5 51 20.17	30.871943	0.28	10 31 53
16	13 58 14.911	+ 5 40 04.73	13 56 41.273	+ 5 49 09.56	30.841055	0.29	10 16 42
20	13 58 47.429	+ 5 38 06.69	13 57 13.715	+ 5 47 11.64	30.806260	0.29	10 01 31
24	13 59 19.128	+ 5 36 22.00	13 57 45.353	+ 5 45 26.89	30.767679	0.29	9 46 19
28	13 59 49.920	+ 5 34 50.81	13 58 16.059	+ 5 43 55.77	30.725466	0.29	9 31 06
DEC 2	14 00 19.674	+ 5 33 33.42	13 58 45.709	+ 5 42 38.63	30.679811	0.29	9 15 51
6	14 00 48.239	+ 5 32 30.32	13 59 14.186	+ 5 41 35.74	30.630928	0.29	9 00 36
10	14 01 15.526	+ 5 31 41.71	13 59 41.384	+ 5 40 47.26	30.579047	0.29	8 45 19
14	14 01 41.479	+ 5 31 07.32	14 00 07.207	+ 5 40 13.28	30.524397	0.29	8 30 02
18	14 02 05.937	+ 5 30 47.55	14 00 31.560	+ 5 39 53.90	30.467202	0.29	8 14 42
22	14 02 28.812	+ 5 30 42.59	14 00 54.341	+ 5 39 49.18	30.407701	0.29	7 59 21
26	14 02 50.044	+ 5 30 52.16	14 01 15.455	+ 5 39 59.13	30.346166	0.29	7 43 58
30	14 03 09.526	+ 5 31 16.13	14 01 34.810	+ 5 40 23.64	30.282893	0.29	7 28 34

GEOCENTRIC POSITIONS OF PLUTO FOR OH ET

--- 1982 ---

DATE		RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
		H M S	D ' ''	H M S	O ' ''	AU	''	H M S
JAN	3	14 03 27.150	+ 5 31 54.55	14 01 52.330	+ 5 41 02.50	30.218196	0.29	7 13 08
	7	14 03 42.885	+ 5 32 47.03	14 02 07.954	+ 5 41 55.38	30.152396	0.29	6 57 40
	11	14 03 56.707	+ 5 33 52.85	14 02 21.633	+ 5 43 01.87	30.085801	0.29	6 42 10
	15	14 04 08.505	+ 5 35 11.99	14 02 33.320	+ 5 44 21.58	30.018704	0.29	6 26 38
	19	14 04 18.258	+ 5 36 44.02	14 02 42.971	+ 5 45 54.06	29.951412	0.29	6 11 03
	23	14 04 25.957	+ 5 38 28.17	14 02 50.546	+ 5 47 38.80	29.884250	0.29	5 55 27
	27	14 04 31.552	+ 5 40 23.85	14 02 56.019	+ 5 49 35.17	29.817557	0.29	5 39 49
	31	14 04 35.008	+ 5 42 30.58	14 02 59.381	+ 5 51 42.45	29.751677	0.30	5 24 09
FEB	4	14 04 36.376	+ 5 44 47.37	14 03 00.640	+ 5 53 59.78	29.686946	0.30	5 08 27
	8	14 04 35.683	+ 5 47 13.11	14 02 59.819	+ 5 56 26.29	29.623671	0.30	4 52 42
	12	14 04 32.900	+ 5 49 47.32	14 02 56.946	+ 5 59 01.10	29.562139	0.30	4 36 56
	16	14 04 28.089	+ 5 52 29.06	14 02 52.050	+ 6 01 43.34	29.502636	0.30	4 21 07
	20	14 04 21.313	+ 5 55 17.12	14 02 45.168	+ 6 04 32.04	29.445458	0.30	4 05 17
	24	14 04 12.592	+ 5 58 10.58	14 02 36.353	+ 6 07 26.18	29.390898	0.30	3 49 24
	28	14 04 01.982	+ 6 01 08.55	14 02 25.676	+ 6 10 24.64	29.339243	0.30	3 33 30
MAR	4	14 03 49.619	+ 6 04 09.60	14 02 13.226	+ 6 13 26.24	29.290752	0.30	3 17 34
	8	14 03 35.588	+ 6 07 12.48	14 01 59.101	+ 6 16 29.81	29.245647	0.30	3 01 36
	12	14 03 19.944	+ 6 10 16.45	14 01 43.403	+ 6 19 34.25	29.204121	0.30	2 45 37
	16	14 03 02.832	+ 6 13 20.25	14 01 26.233	+ 6 22 38.47	29.166359	0.30	2 29 37
	20	14 02 44.374	+ 6 16 22.58	14 01 07.700	+ 6 25 41.35	29.132543	0.30	2 13 34
	24	14 02 24.655	+ 6 19 22.44	14 00 47.924	+ 6 28 41.74	29.102845	0.30	1 57 31
	28	14 02 03.807	+ 6 22 18.85	14 00 27.042	+ 6 31 38.48	29.077419	0.30	1 41 27
APR	1	14 01 42.027	+ 6 25 10.30	14 00 05.200	+ 6 34 30.37	29.056381	0.30	1 25 21
	5	14 01 19.433	+ 6 27 55.73	13 59 42.553	+ 6 37 16.31	29.039803	0.30	1 09 15
	9	14 00 56.145	+ 6 30 34.48	13 59 19.245	+ 6 39 55.32	29.027729	0.30	0 53 09
	13	14 00 32.351	+ 6 33 05.36	13 58 55.421	+ 6 42 26.46	29.020190	0.30	0 37 01
	17	14 00 08.199	+ 6 35 27.33	13 58 31.226	+ 6 44 48.82	29.017214	0.30	0 20 54
	21	13 59 43.805	+ 6 37 39.70	13 58 06.810	+ 6 47 01.50	29.018812	0.30	0 04 46
	25	13 59 19.334	+ 6 39 41.68	13 57 42.334	+ 6 49 03.61	29.024976	0.30	23 44 36
	29	13 58 55.000	+ 6 41 32.10	13 57 17.961	+ 6 50 54.33	29.035658	0.30	23 28 28
MAY	3	13 58 30.910	+ 6 43 10.43	13 56 53.853	+ 6 52 32.95	29.050764	0.30	23 12 21
	7	13 58 07.203	+ 6 44 36.34	13 56 30.155	+ 6 53 58.91	29.070180	0.30	22 56 13
	11	13 57 44.062	+ 6 45 49.05	13 56 07.005	+ 6 55 11.72	29.093789	0.30	22 40 07
	15	13 57 21.613	+ 6 46 48.06	13 55 44.539	+ 6 56 10.94	29.121467	0.30	22 24 01
	19	13 56 59.955	+ 6 47 33.20	13 55 22.890	+ 6 56 56.16	29.153081	0.30	22 07 56
	23	13 56 39.248	+ 6 48 04.11	13 55 02.196	+ 6 57 27.02	29.188478	0.30	21 51 52
	27	13 56 19.664	+ 6 48 20.14	13 54 42.592	+ 6 57 43.21	29.227471	0.30	21 35 49
	31	13 56 01.264	+ 6 48 21.45	13 54 24.202	+ 6 57 44.58	29.269837	0.30	21 19 48
JUNE	4	13 55 44.164	+ 6 48 08.14	13 54 07.130	+ 6 57 31.13	29.315341	0.30	21 03 47
	8	13 55 28.497	+ 6 47 39.95	13 53 51.470	+ 6 57 02.89	29.363756	0.30	20 47 48
	12	13 55 14.333	+ 6 46 56.99	13 53 37.310	+ 6 56 19.96	29.414854	0.30	20 31 51
	16	13 55 01.726	+ 6 45 59.61	13 53 24.734	+ 6 55 22.45	29.468407	0.30	20 15 55
	20	13 54 50.791	+ 6 44 47.89	13 53 13.825	+ 6 54 10.51	29.524170	0.30	20 00 01
	24	13 54 41.633	+ 6 43 21.70	13 53 04.662	+ 6 52 44.35	29.581871	0.30	19 44 09
	28	13 54 34.246	+ 6 41 41.81	13 52 57.306	+ 6 51 04.32	29.641215	0.30	19 28 18

GEOCENTRIC POSITIONS OF PLUTO FOR 0H ET

--- 1982 ---

DATE		RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
		H M S	D ' "	H M S	O ' "	AU	"	H M S
JULY	2	13 54 28.702	+ 6 39 48.68	13 52 51.802	+ 6 49 10.87	29.701907	0.30	19 12 29
	6	13 54 25.063	+ 6 37 42.50	13 52 48.179	+ 6 47 04.51	29.763669	0.30	18 56 42
	10	13 54 23.329	+ 6 35 23.86	13 52 46.466	+ 6 44 45.73	29.826230	0.29	18 40 57
	14	13 54 23.501	+ 6 32 53.50	13 52 46.685	+ 6 42 15.04	29.889324	0.29	18 25 14
	18	13 54 25.642	+ 6 30 11.77	13 52 48.856	+ 6 39 32.97	29.952676	0.29	18 09 33
	22	13 54 29.776	+ 6 27 19.02	13 52 52.996	+ 6 36 40.09	30.015992	0.29	17 53 54
	26	13 54 35.839	+ 6 24 16.36	13 52 59.104	+ 6 33 37.10	30.078962	0.29	17 38 17
	30	13 54 43.852	+ 6 21 04.46	13 53 07.160	+ 6 30 24.75	30.141291	0.29	17 22 42
AUG	3	13 54 53.809	+ 6 17 43.82	13 53 17.137	+ 6 27 03.82	30.202706	0.29	17 07 08
	7	13 55 05.647	+ 6 14 15.36	13 53 29.003	+ 6 23 35.05	30.262952	0.29	16 51 36
	11	13 55 19.319	+ 6 10 39.99	13 53 42.728	+ 6 19 59.18	30.321778	0.29	16 36 07
	15	13 55 34.843	+ 6 06 58.19	13 53 58.276	+ 6 16 16.95	30.378932	0.29	16 20 39
	19	13 55 52.166	+ 6 03 10.62	13 54 15.609	+ 6 12 29.14	30.434150	0.29	16 05 13
	23	13 56 11.184	+ 5 59 18.57	13 54 34.673	+ 6 08 36.59	30.487162	0.29	15 49 48
	27	13 56 31.875	+ 5 55 22.74	13 54 55.398	+ 6 04 40.23	30.537719	0.29	15 34 26
	31	13 56 54.174	+ 5 51 23.82	13 55 17.708	+ 6 00 40.94	30.585604	0.29	15 19 04
SEPT	4	13 57 17.967	+ 5 47 22.86	13 55 41.528	+ 5 56 39.57	30.630620	0.29	15 03 45
	8	13 57 43.181	+ 5 43 20.81	13 56 06.782	+ 5 52 36.94	30.672580	0.29	14 48 26
	12	13 58 09.789	+ 5 39 18.16	13 56 33.395	+ 5 48 33.85	30.711299	0.29	14 33 09
	16	13 58 37.679	+ 5 35 15.77	13 57 01.286	+ 5 44 31.14	30.746582	0.29	14 17 54
	20	13 59 06.723	+ 5 31 14.89	13 57 30.361	+ 5 40 29.71	30.778243	0.29	14 02 39
	24	13 59 36.867	+ 5 27 16.18	13 58 00.513	+ 5 36 30.48	30.806123	0.29	13 47 25
	28	14 00 07.999	+ 5 23 20.39	13 58 31.633	+ 5 32 34.34	30.830096	0.29	13 32 13
OCT	2	14 00 39.973	+ 5 19 28.59	13 59 03.614	+ 5 28 42.12	30.850063	0.29	13 17 01
	6	14 01 12.699	+ 5 15 41.60	13 59 36.348	+ 5 24 54.58	30.865936	0.28	13 01 50
	10	14 01 46.116	+ 5 11 59.85	14 00 09.734	+ 5 21 12.49	30.877633	0.28	12 46 40
	14	14 02 20.068	+ 5 08 24.26	14 00 43.663	+ 5 17 36.63	30.885066	0.28	12 31 30
	18	14 02 54.423	+ 5 04 55.93	14 01 18.014	+ 5 14 07.82	30.888164	0.28	12 16 21
	22	14 03 29.100	+ 5 01 35.36	14 01 52.658	+ 5 10 46.87	30.886890	0.28	12 01 12
	26	14 04 03.956	+ 4 58 23.24	14 02 27.466	+ 5 07 34.55	30.881242	0.28	11 46 03
	30	14 04 38.832	+ 4 55 20.51	14 03 02.313	+ 5 04 31.54	30.871243	0.28	11 30 54
NOV	3	14 05 13.634	+ 4 52 27.78	14 03 37.078	+ 5 01 38.45	30.856936	0.29	11 15 45
	7	14 05 48.280	+ 4 49 45.27	14 04 11.646	+ 4 58 55.86	30.838364	0.29	11 00 35
	11	14 06 22.588	+ 4 47 13.87	14 04 45.895	+ 4 56 24.37	30.815571	0.29	10 45 26
	15	14 06 56.439	+ 4 44 54.35	14 05 19.697	+ 4 54 04.60	30.788621	0.29	10 30 16
	19	14 07 29.740	+ 4 42 46.94	14 05 52.916	+ 4 51 57.11	30.757616	0.29	10 15 05
	23	14 08 02.336	+ 4 40 52.18	14 06 25.423	+ 4 50 02.40	30.722693	0.29	9 59 54
	27	14 08 34.075	+ 4 39 10.69	14 06 57.094	+ 4 48 20.88	30.684013	0.29	9 44 42
DEC	1	14 09 04.879	+ 4 37 42.71	14 07 27.813	+ 4 46 52.84	30.641751	0.29	9 29 29
	5	14 09 34.662	+ 4 36 28.17	14 07 57.473	+ 4 45 38.56	30.596084	0.29	9 14 15
	9	14 10 03.244	+ 4 35 27.74	14 08 25.964	+ 4 44 38.30	30.547185	0.29	8 58 59
	13	14 10 30.538	+ 4 34 41.70	14 08 53.169	+ 4 43 52.31	30.495252	0.29	8 43 43
	17	14 10 56.463	+ 4 34 09.92	14 09 18.974	+ 4 43 20.79	30.440518	0.29	8 28 25
	21	14 11 20.877	+ 4 33 52.57	14 09 43.271	+ 4 43 03.81	30.383243	0.29	8 13 05
	25	14 11 43.667	+ 4 33 49.87	14 10 05.966	+ 4 43 01.34	30.323706	0.29	7 57 44
	29	14 12 04.792	+ 4 34 01.51	14 10 26.975	+ 4 43 13.26	30.262194	0.29	7 42 21

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DATE	RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
	H M S	O ' ''	H M S	O ' ''	AU	''	H M S
JAN 2	14 12 24.187	+ 4 34 27.05	14 10 46.226	+ 4 43 39.37	30.198986	0.29	7 26 57
6	14 12 41.712	+ 4 35 06.76	14 11 03.647	+ 4 44 19.49	30.134352	0.29	7 11 30
10	14 12 57.339	+ 4 36 00.31	14 11 19.164	+ 4 45 13.38	30.068582	0.29	6 56 02
14	14 13 11.019	+ 4 37 07.14	14 11 32.712	+ 4 46 20.75	30.001995	0.29	6 40 32
18	14 13 22.661	+ 4 38 26.97	14 11 44.235	+ 4 47 41.17	29.934923	0.29	6 25 00
22	14 13 32.219	+ 4 39 59.46	14 11 53.696	+ 4 49 14.09	29.867708	0.29	6 09 26
26	14 13 39.718	+ 4 41 43.73	14 12 01.073	+ 4 50 58.88	29.800684	0.30	5 53 49
30	14 13 45.138	+ 4 43 38.93	14 12 06.357	+ 4 52 54.84	29.734168	0.30	5 38 11
FEB 3	14 13 48.415	+ 4 45 44.86	14 12 09.541	+ 4 55 01.31	29.668457	0.30	5 22 30
7	14 13 49.598	+ 4 48 00.60	14 12 10.621	+ 4 57 17.57	29.603860	0.30	5 06 48
11	14 13 48.697	+ 4 50 25.17	14 12 09.601	+ 4 59 42.83	29.540701	0.30	4 51 03
15	14 13 45.696	+ 4 52 57.88	14 12 06.505	+ 5 02 16.19	29.479305	0.30	4 35 16
19	14 13 40.639	+ 4 55 37.87	14 12 01.371	+ 5 04 56.66	29.419991	0.30	4 19 27
23	14 13 33.628	+ 4 58 23.80	14 11 54.255	+ 5 07 43.20	29.363056	0.30	4 03 37
27	14 13 24.706	+ 5 01 14.55	14 11 45.228	+ 5 10 34.73	29.308764	0.30	3 47 45
MAR 3	14 13 13.901	+ 5 04 09.54	14 11 34.359	+ 5 13 30.23	29.257356	0.30	3 31 50
7	14 13 01.342	+ 5 07 07.47	14 11 21.719	+ 5 16 28.69	29.209070	0.30	3 15 54
11	14 12 47.104	+ 5 10 07.12	14 11 07.393	+ 5 19 29.01	29.164149	0.30	2 59 56
15	14 12 31.250	+ 5 13 07.60	14 10 51.479	+ 5 22 30.07	29.122827	0.30	2 43 56
19	14 12 13.908	+ 5 16 07.79	14 10 34.090	+ 5 25 30.66	29.085314	0.30	2 27 55
23	14 11 55.250	+ 5 19 06.15	14 10 15.354	+ 5 28 29.60	29.051790	0.30	2 11 53
27	14 11 35.367	+ 5 22 01.65	14 09 55.406	+ 5 31 25.74	29.022391	0.30	1 55 50
31	14 11 14.369	+ 5 24 53.55	14 09 34.377	+ 5 34 18.02	28.997228	0.30	1 39 45
APR 4	14 10 52.441	+ 5 27 40.52	14 09 12.397	+ 5 37 05.43	28.976404	0.30	1 23 40
8	14 10 29.699	+ 5 30 21.49	14 08 49.601	+ 5 39 46.95	28.960019	0.30	1 07 34
12	14 10 06.259	+ 5 32 55.68	14 08 26.137	+ 5 42 21.53	28.948155	0.30	0 51 27
16	14 09 42.305	+ 5 35 22.03	14 08 02.162	+ 5 44 48.14	28.940867	0.30	0 35 19
20	14 09 18.034	+ 5 37 39.23	14 07 37.840	+ 5 47 05.80	28.938174	0.30	0 19 11
24	14 08 53.552	+ 5 39 46.64	14 07 13.331	+ 5 49 13.64	28.940049	0.30	0 03 03
28	14 08 29.012	+ 5 41 43.73	14 06 48.789	+ 5 51 10.91	28.946442	0.30	23 42 53
MAY 2	14 08 04.609	+ 5 43 29.47	14 06 24.356	+ 5 52 56.95	28.957302	0.30	23 26 46
6	14 07 40.455	+ 5 45 03.26	14 06 00.178	+ 5 54 31.10	28.972569	0.30	23 10 38
10	14 07 16.676	+ 5 46 24.71	14 05 36.407	+ 5 55 52.72	28.992170	0.30	22 54 31
14	14 06 53.464	+ 5 47 33.13	14 05 13.193	+ 5 57 01.24	29.016003	0.30	22 38 24
18	14 06 30.990	+ 5 48 27.71	14 04 50.689	+ 5 57 56.14	29.043930	0.30	22 22 18
22	14 06 09.332	+ 5 49 08.44	14 04 29.037	+ 5 58 37.06	29.075777	0.30	22 06 13
26	14 05 48.642	+ 5 49 35.16	14 04 08.362	+ 5 59 03.77	29.111357	0.30	21 50 10
30	14 05 29.070	+ 5 49 47.37	14 03 48.780	+ 5 59 16.12	29.150487	0.30	21 34 07
JUNE 3	14 05 10.689	+ 5 49 45.07	14 03 30.401	+ 5 59 13.97	29.192981	0.30	21 18 05
7	14 04 53.596	+ 5 49 28.38	14 03 13.336	+ 5 58 57.22	29.238644	0.30	21 02 05
11	14 04 37.945	+ 5 48 57.03	14 02 57.696	+ 5 58 25.81	29.287259	0.30	20 46 06
15	14 04 23.843	+ 5 48 10.83	14 02 43.583	+ 5 57 39.77	29.338579	0.30	20 30 08
19	14 04 11.316	+ 5 47 10.40	14 02 31.085	+ 5 56 39.27	29.392332	0.30	20 14 13
23	14 04 00.476	+ 5 45 55.91	14 02 20.272	+ 5 55 24.59	29.448243	0.30	19 58 18
27	14 03 51.401	+ 5 44 27.42	14 02 11.202	+ 5 53 56.07	29.506054	0.30	19 42 26

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DATE		RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
		H M S	O ' ''	H M S	O ' ''	AU	''	H M S
JULY	1	14 03 44.106	+ 5 42 45.46	14 02 03.928	+ 5 52 14.04	29.565510	0.30	19 26 36
	5	14 03 38.636	+ 5 40 50.55	14 01 58.502	+ 5 50 18.85	29.626349	0.30	19 10 47
	9	14 03 35.088	+ 5 38 42.81	14 01 54.972	+ 5 48 10.89	29.688300	0.30	18 55 00
	13	14 03 33.492	+ 5 36 22.55	14 01 53.379	+ 5 45 50.60	29.751067	0.30	18 39 15
	17	14 03 33.813	+ 5 33 50.83	14 01 53.745	+ 5 43 18.57	29.814338	0.30	18 23 33
	21	14 03 36.113	+ 5 31 08.07	14 01 56.076	+ 5 40 35.46	29.877816	0.29	18 07 52
	25	14 03 40.392	+ 5 28 14.74	14 02 00.369	+ 5 37 41.94	29.941222	0.29	17 52 12
	29	14 03 46.604	+ 5 25 11.74	14 02 06.616	+ 5 34 38.65	30.004291	0.29	17 36 35
AUG	2	14 03 54.748	+ 5 21 59.81	14 02 14.810	+ 5 31 26.24	30.066758	0.29	17 21 00
	6	14 04 04.860	+ 5 18 39.30	14 02 24.939	+ 5 28 05.37	30.128348	0.29	17 05 27
	10	14 04 16.892	+ 5 15 10.90	14 02 36.983	+ 5 24 36.76	30.188776	0.29	16 49 56
	14	14 04 30.769	+ 5 11 35.87	14 02 50.909	+ 5 21 01.22	30.247748	0.29	16 34 26
	18	14 04 46.500	+ 5 07 54.75	14 03 06.664	+ 5 17 19.62	30.304994	0.29	16 18 58
	22	14 05 04.015	+ 5 04 08.28	14 03 24.193	+ 5 13 32.81	30.360271	0.29	16 03 32
	26	14 05 23.222	+ 5 00 17.53	14 03 43.437	+ 5 09 41.58	30.413353	0.29	15 48 08
	30	14 05 44.082	+ 4 56 23.28	14 04 04.340	+ 5 05 46.71	30.464017	0.29	15 32 46
SEPT	3	14 06 06.579	+ 4 52 26.02	14 04 26.841	+ 5 01 49.01	30.512040	0.29	15 17 25
	7	14 06 30.602	+ 4 48 26.65	14 04 50.875	+ 4 57 49.28	30.557190	0.29	15 02 05
	11	14 06 56.050	+ 4 44 26.45	14 05 16.359	+ 4 53 48.45	30.599238	0.29	14 46 47
	15	14 07 22.887	+ 4 40 25.96	14 05 43.200	+ 4 49 47.43	30.637988	0.29	14 31 30
	19	14 07 50.988	+ 4 36 26.06	14 06 11.301	+ 4 45 47.12	30.673274	0.29	14 16 15
	23	14 08 20.232	+ 4 32 27.84	14 06 40.567	+ 4 41 48.33	30.704951	0.29	14 01 00
	27	14 08 50.554	+ 4 28 32.02	14 07 10.905	+ 4 37 51.86	30.732880	0.29	13 45 47
OCT	1	14 09 21.892	+ 4 24 39.07	14 07 42.220	+ 4 33 58.50	30.756928	0.29	13 30 35
	5	14 09 54.092	+ 4 20 50.03	14 08 14.411	+ 4 30 09.05	30.776956	0.29	13 15 23
	9	14 10 27.041	+ 4 17 06.01	14 08 47.365	+ 4 26 24.41	30.792839	0.29	13 00 13
	13	14 11 00.666	+ 4 13 27.48	14 09 20.959	+ 4 22 45.43	30.804489	0.29	12 45 02
	17	14 11 34.807	+ 4 09 55.33	14 09 55.070	+ 4 19 12.92	30.811855	0.29	12 29 53
	21	14 12 09.325	+ 4 06 30.53	14 10 29.578	+ 4 15 47.61	30.814904	0.29	12 14 43
	25	14 12 44.144	+ 4 03 13.62	14 11 04.369	+ 4 12 30.17	30.813616	0.29	11 59 34
	29	14 13 19.166	+ 4 00 04.98	14 11 39.328	+ 4 09 21.29	30.807976	0.29	11 44 26
NOV	2	14 13 54.213	+ 3 57 05.62	14 12 14.334	+ 4 06 21.63	30.797970	0.29	11 29 17
	6	14 14 29.176	+ 3 54 16.35	14 12 49.257	+ 4 03 31.92	30.783604	0.29	11 14 08
	10	14 15 03.958	+ 3 51 37.49	14 13 23.962	+ 4 00 52.84	30.764925	0.29	10 58 59
	14	14 15 38.380	+ 3 49 09.79	14 13 58.314	+ 3 58 24.99	30.742016	0.29	10 43 49
	18	14 16 12.306	+ 3 46 53.96	14 14 32.189	+ 3 56 08.86	30.714981	0.29	10 28 39
	22	14 16 45.664	+ 3 44 50.23	14 15 05.467	+ 3 54 04.90	30.683933	0.29	10 13 29
	26	14 17 18.336	+ 3 42 58.79	14 15 38.032	+ 3 52 13.51	30.648992	0.29	9 58 18
	30	14 17 50.143	+ 3 41 20.45	14 16 09.763	+ 3 50 35.10	30.610280	0.29	9 43 06
DEC	4	14 18 21.002	+ 3 39 55.59	14 16 40.535	+ 3 49 10.10	30.567941	0.29	9 27 53
	8	14 18 50.803	+ 3 38 44.23	14 17 10.218	+ 3 47 58.86	30.522163	0.29	9 12 39
	12	14 19 19.381	+ 3 37 46.85	14 17 38.695	+ 3 47 01.61	30.473161	0.29	8 57 23
	16	14 19 46.628	+ 3 37 03.73	14 18 05.855	+ 3 46 18.49	30.421169	0.29	8 42 06
	20	14 20 12.491	+ 3 36 34.67	14 18 31.599	+ 3 45 49.56	30.366429	0.29	8 26 48
	24	14 20 36.862	+ 3 36 19.54	14 18 55.835	+ 3 45 34.81	30.309178	0.29	8 11 29
	28	14 20 59.596	+ 3 36 18.79	14 19 18.471	+ 3 45 34.27	30.249654	0.29	7 56 08

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DATE		RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
		H M S	O ' ''	H M S	O ' ''	AU	''	H M S
JAN	1	14 21 20.650	+ 3 36 32.22	14 19 39.409	+ 3 45 47.91	30.188118	0.29	7 40 45
	5	14 21 39.937	+ 3 36 59.49	14 19 58.558	+ 3 46 15.62	30.124865	0.29	7 25 20
	9	14 21 57.333	+ 3 37 40.64	14 20 15.842	+ 3 46 57.18	30.060209	0.29	7 09 54
	13	14 22 12.787	+ 3 38 35.42	14 20 31.197	+ 3 47 52.23	29.994473	0.29	6 54 26
	17	14 22 26.295	+ 3 39 43.08	14 20 44.572	+ 3 49 00.34	29.927977	0.29	6 38 55
	21	14 22 37.788	+ 3 41 03.12	14 20 55.929	+ 3 50 21.04	29.861026	0.29	6 23 23
	25	14 22 47.186	+ 3 42 35.51	14 21 05.231	+ 3 51 53.85	29.793919	0.30	6 07 48
	29	14 22 54.515	+ 3 44 19.45	14 21 12.439	+ 3 53 38.27	29.726970	0.30	5 52 12
FEB	2	14 22 59.732	+ 3 46 14.19	14 21 17.529	+ 3 55 33.68	29.660515	0.30	5 36 33
	6	14 23 02.790	+ 3 48 19.30	14 21 20.491	+ 3 57 39.35	29.594896	0.30	5 20 52
	10	14 23 03.722	+ 3 50 33.97	14 21 21.333	+ 3 59 54.46	29.530449	0.30	5 05 10
	14	14 23 02.589	+ 3 52 56.98	14 21 20.079	+ 4 02 18.12	29.467493	0.30	4 49 25
	18	14 22 59.384	+ 3 55 27.50	14 21 16.765	+ 4 04 49.40	29.406321	0.30	4 33 38
	22	14 22 54.122	+ 3 58 05.02	14 21 11.427	+ 4 07 27.42	29.347208	0.30	4 17 49
	26	14 22 46.904	+ 4 00 48.28	14 21 04.107	+ 4 10 11.29	29.290436	0.30	4 01 58
MAR	1	14 22 37.750	+ 4 03 36.26	14 20 54.856	+ 4 13 00.00	29.236295	0.30	3 46 05
	5	14 22 26.704	+ 4 06 28.18	14 20 43.745	+ 4 15 52.49	29.185069	0.30	3 30 10
	9	14 22 13.886	+ 4 09 22.83	14 20 30.863	+ 4 18 47.62	29.137017	0.30	3 14 14
	13	14 21 59.426	+ 4 12 18.76	14 20 16.309	+ 4 21 44.22	29.092371	0.30	2 58 16
	17	14 21 43.382	+ 4 15 15.00	14 20 00.194	+ 4 24 41.18	29.051328	0.30	2 42 17
	21	14 21 25.860	+ 4 18 10.82	14 19 42.626	+ 4 27 37.45	29.014059	0.30	2 26 15
	25	14 21 07.024	+ 4 21 04.75	14 19 23.714	+ 4 30 31.99	28.980733	0.30	2 10 13
	29	14 20 46.948	+ 4 23 55.84	14 19 03.578	+ 4 33 23.73	28.951521	0.30	1 54 09
APR	2	14 20 25.751	+ 4 26 43.19	14 18 42.352	+ 4 36 11.53	28.926573	0.30	1 38 05
	6	14 20 03.620	+ 4 29 25.55	14 18 20.182	+ 4 38 54.28	28.906007	0.30	1 21 59
	10	14 19 40.723	+ 4 32 01.55	14 17 57.223	+ 4 41 30.91	28.889909	0.30	1 05 52
	14	14 19 17.161	+ 4 34 30.51	14 17 33.628	+ 4 44 00.40	28.878321	0.30	0 49 45
	18	14 18 53.099	+ 4 36 51.69	14 17 09.546	+ 4 46 21.90	28.871263	0.30	0 33 38
	22	14 18 28.722	+ 4 39 03.86	14 16 45.120	+ 4 48 34.58	28.868751	0.30	0 17 30
	26	14 18 04.127	+ 4 41 06.40	14 16 20.499	+ 4 50 37.61	28.870799	0.30	0 01 22
	30	14 17 39.468	+ 4 42 58.69	14 15 55.840	+ 4 52 30.16	28.877395	0.30	23 41 12
MAY	4	14 17 14.950	+ 4 44 39.70	14 15 31.304	+ 4 54 11.45	28.888497	0.30	23 25 04
	8	14 16 50.735	+ 4 46 08.56	14 15 07.053	+ 4 55 40.78	28.904027	0.30	23 08 56
	12	14 16 26.922	+ 4 47 25.07	14 14 43.241	+ 4 56 57.58	28.923868	0.30	22 52 49
	16	14 16 03.691	+ 4 48 28.77	14 14 20.008	+ 4 58 01.45	28.947890	0.30	22 36 42
	20	14 15 41.195	+ 4 49 18.97	14 13 57.486	+ 4 58 52.00	28.975964	0.30	22 20 37
	24	14 15 19.514	+ 4 49 55.58	14 13 35.806	+ 4 59 28.87	29.007958	0.30	22 04 31
	28	14 14 58.788	+ 4 50 18.40	14 13 15.102	+ 4 59 51.74	29.043719	0.30	21 48 27
JUNE	1	14 14 39.196	+ 4 50 26.88	14 12 55.506	+ 5 00 00.33	29.083070	0.30	21 32 25
	5	14 14 20.847	+ 4 50 20.76	14 12 37.144	+ 4 59 54.49	29.125800	0.30	21 16 23
	9	14 14 03.805	+ 4 50 00.40	14 12 20.128	+ 4 59 34.18	29.171672	0.30	21 00 23
	13	14 13 48.219	+ 4 49 25.75	14 12 04.552	+ 4 58 59.50	29.220445	0.30	20 44 24
	17	14 13 34.174	+ 4 48 36.68	14 11 50.499	+ 4 58 10.59	29.271889	0.30	20 28 27
	21	14 13 21.702	+ 4 47 33.68	14 11 38.051	+ 4 57 07.59	29.325775	0.30	20 12 31
	25	14 13 10.903	+ 4 46 16.93	14 11 27.289	+ 4 55 50.66	29.381861	0.30	19 56 37
	29	14 13 01.896	+ 4 44 46.36	14 11 18.286	+ 4 54 20.03	29.439887	0.30	19 40 45

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DATE		RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	Hp	ET TRANS
		H M S	O ' ''	H M S	O ' ''	AU	''	H M S
JULY	3	14 12 54.713	+ 4 43 02.27	14 11 11.109	+ 4 52 36.00	29.499565	0.30	19 24 54
	7	14 12 49.370	+ 4 41 05.52	14 11 05.808	+ 4 50 39.02	29.560597	0.30	19 09 06
	11	14 12 45.959	+ 4 38 56.32	14 11 02.414	+ 4 48 29.61	29.622689	0.30	18 53 19
	15	14 12 44.486	+ 4 36 35.08	14 11 00.948	+ 4 46 08.30	29.685570	0.30	18 37 34
	19	14 12 44.929	+ 4 34 02.66	14 11 01.430	+ 4 43 35.62	29.748973	0.30	18 21 51
	23	14 12 47.336	+ 4 31 19.54	14 11 03.880	+ 4 40 52.10	29.812625	0.30	18 06 10
	27	14 12 51.756	+ 4 28 25.97	14 11 08.309	+ 4 37 58.29	29.876242	0.29	17 50 32
	31	14 12 58.149	+ 4 25 22.70	14 11 14.721	+ 4 34 54.83	29.939522	0.29	17 34 55
AUG	4	14 13 06.483	+ 4 22 10.83	14 11 23.102	+ 4 31 42.48	30.002161	0.29	17 19 20
	8	14 13 16.790	+ 4 18 50.75	14 11 33.423	+ 4 28 22.02	30.063872	0.29	17 03 47
	12	14 13 29.000	+ 4 15 23.25	14 11 45.648	+ 4 24 54.22	30.124397	0.29	16 48 15
	16	14 13 43.048	+ 4 11 49.35	14 11 59.742	+ 4 21 19.83	30.183487	0.29	16 32 46
	20	14 13 58.936	+ 4 08 09.68	14 12 15.667	+ 4 17 39.56	30.240890	0.29	16 17 19
	24	14 14 16.648	+ 4 04 24.68	14 12 33.383	+ 4 13 54.16	30.296353	0.29	16 01 53
	28	14 14 36.083	+ 4 00 35.37	14 12 52.839	+ 4 10 04.45	30.349610	0.29	15 46 29
SEPT	1	14 14 57.177	+ 3 56 42.89	14 13 13.970	+ 4 06 11.31	30.400401	0.29	15 31 07
	5	14 15 19.904	+ 3 52 47.72	14 13 36.697	+ 4 02 15.65	30.448498	0.29	15 15 46
	9	14 15 44.135	+ 3 48 50.85	14 14 00.940	+ 3 58 18.33	30.493700	0.29	15 00 27
	13	14 16 09.778	+ 3 44 53.35	14 14 26.617	+ 3 54 20.15	30.535821	0.29	14 45 09
	17	14 16 36.796	+ 3 40 55.80	14 14 53.652	+ 3 50 21.91	30.574679	0.29	14 29 52
	21	14 17 05.119	+ 3 36 58.75	14 15 21.959	+ 3 46 24.39	30.610091	0.29	14 14 37
	25	14 17 34.603	+ 3 33 03.34	14 15 51.451	+ 3 42 28.46	30.641873	0.29	13 59 23
	29	14 18 05.165	+ 3 29 10.59	14 16 22.022	+ 3 38 34.99	30.669854	0.29	13 44 10
OCT	3	14 18 36.731	+ 3 25 21.00	14 16 53.558	+ 3 34 44.91	30.693899	0.29	13 28 57
	7	14 19 09.130	+ 3 21 35.61	14 17 25.947	+ 3 30 59.01	30.713908	0.29	13 13 46
	11	14 19 42.256	+ 3 17 55.37	14 17 59.079	+ 3 27 18.07	30.729795	0.29	12 58 35
	15	14 20 16.045	+ 3 14 20.75	14 18 32.844	+ 3 23 42.82	30.741483	0.29	12 43 25
	19	14 20 50.384	+ 3 10 52.31	14 19 07.135	+ 3 20 13.97	30.748898	0.29	12 28 16
	23	14 21 25.105	+ 3 07 31.13	14 19 41.834	+ 3 16 52.28	30.751971	0.29	12 13 07
	27	14 22 00.120	+ 3 04 18.01	14 20 16.814	+ 3 13 38.56	30.750652	0.29	11 57 58
	31	14 22 35.316	+ 3 01 13.35	14 20 51.940	+ 3 10 33.55	30.744933	0.29	11 42 50
NOV	4	14 23 10.503	+ 2 58 18.12	14 21 27.081	+ 3 07 37.93	30.734841	0.29	11 27 41
	8	14 23 45.573	+ 2 55 33.01	14 22 02.114	+ 3 04 52.29	30.720421	0.29	11 12 32
	12	14 24 20.449	+ 2 52 58.27	14 22 36.917	+ 3 02 17.15	30.701726	0.29	10 57 23
	16	14 24 54.992	+ 2 50 34.35	14 23 11.371	+ 2 59 53.05	30.678813	0.29	10 42 14
	20	14 25 29.032	+ 2 48 22.15	14 23 45.351	+ 2 57 40.53	30.651748	0.29	10 27 04
	24	14 26 02.490	+ 2 46 22.09	14 24 18.723	+ 2 55 40.15	30.620622	0.29	10 11 54
	28	14 26 35.230	+ 2 44 34.37	14 24 51.352	+ 2 53 52.38	30.585567	0.29	9 56 42
DEC	2	14 27 07.071	+ 2 42 59.73	14 25 23.110	+ 2 52 17.61	30.546751	0.29	9 41 30
	6	14 27 37.920	+ 2 41 38.46	14 25 53.879	+ 2 50 56.09	30.504354	0.29	9 26 17
	10	14 28 07.707	+ 2 40 30.48	14 26 23.549	+ 2 49 48.06	30.458561	0.29	9 11 03
	14	14 28 36.289	+ 2 39 35.96	14 26 52.011	+ 2 48 53.69	30.409562	0.29	8 55 48
	18	14 29 03.524	+ 2 38 55.49	14 27 19.156	+ 2 48 13.18	30.357553	0.29	8 40 31
	22	14 29 29.361	+ 2 38 28.96	14 27 44.870	+ 2 47 46.70	30.302754	0.29	8 25 13
	26	14 29 53.670	+ 2 38 16.28	14 28 09.043	+ 2 47 34.32	30.245424	0.29	8 09 54
	30	14 30 16.306	+ 2 38 17.78	14 28 31.577	+ 2 47 35.98	30.185849	0.29	7 54 32

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DATE	RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
	H M S	O ' ''	H M S	O ' ''	AU	''	H M S
JAN 3	14 30 37.222	+ 2 38 33.23	14 28 52.388	+ 2 47 51.52	30.124318	0.29	7 39 09
7	14 30 56.376	+ 2 39 02.10	14 29 11.403	+ 2 48 20.72	30.061120	0.29	7 23 45
11	14 31 13.655	+ 2 39 44.23	14 29 28.555	+ 2 49 03.30	29.996539	0.29	7 08 18
15	14 31 28.980	+ 2 40 39.69	14 29 43.779	+ 2 49 59.01	29.930858	0.29	6 52 49
19	14 31 42.345	+ 2 41 47.82	14 29 57.010	+ 2 51 07.54	29.864384	0.29	6 37 19
23	14 31 53.660	+ 2 43 08.17	14 30 08.192	+ 2 52 28.47	29.797446	0.30	6 21 46
27	14 32 02.851	+ 2 44 40.54	14 30 17.287	+ 2 54 01.25	29.730390	0.30	6 06 12
31	14 32 09.942	+ 2 46 24.16	14 30 24.273	+ 2 55 45.24	29.663552	0.30	5 50 35
FEB 4	14 32 14.943	+ 2 48 18.03	14 30 29.142	+ 2 57 39.71	29.597256	0.30	5 34 56
8	14 32 17.805	+ 2 50 21.62	14 30 31.896	+ 2 59 43.96	29.531811	0.30	5 19 15
12	14 32 18.535	+ 2 52 34.49	14 30 32.538	+ 3 01 57.27	29.467513	0.30	5 03 32
16	14 32 17.194	+ 2 54 55.47	14 30 31.075	+ 3 04 18.88	29.404672	0.30	4 47 47
20	14 32 13.752	+ 2 57 23.81	14 30 27.529	+ 3 06 47.94	29.343611	0.30	4 32 00
24	14 32 08.233	+ 2 59 58.83	14 30 21.938	+ 3 09 23.48	29.284649	0.30	4 16 11
28	14 32 00.741	+ 3 02 39.31	14 30 14.362	+ 3 12 04.46	29.228084	0.30	4 00 20
MAR 4	14 31 51.354	+ 3 05 23.94	14 30 04.869	+ 3 14 49.84	29.174189	0.30	3 44 27
8	14 31 40.099	+ 3 08 11.97	14 29 53.540	+ 3 17 38.57	29.123208	0.30	3 28 32
12	14 31 27.078	+ 3 11 02.57	14 29 40.454	+ 3 20 29.66	29.075367	0.30	3 12 35
16	14 31 12.413	+ 3 13 54.31	14 29 25.695	+ 3 23 22.13	29.030895	0.30	2 56 37
20	14 30 56.142	+ 3 16 46.36	14 29 09.359	+ 3 26 14.89	28.990021	0.30	2 40 37
24	14 30 38.382	+ 3 19 37.77	14 28 51.560	+ 3 29 06.79	28.952958	0.30	2 24 36
28	14 30 19.306	+ 3 22 27.15	14 28 32.426	+ 3 31 56.69	28.919888	0.30	2 08 33
APR 1	14 29 59.045	+ 3 25 13.20	14 28 12.092	+ 3 34 43.47	28.890955	0.30	1 52 29
5	14 29 37.688	+ 3 27 55.21	14 27 50.699	+ 3 37 26.09	28.866272	0.30	1 36 24
9	14 29 15.411	+ 3 30 32.26	14 27 28.382	+ 3 40 03.59	28.845927	0.30	1 20 18
13	14 28 52.370	+ 3 33 03.02	14 27 05.275	+ 3 42 35.04	28.830008	0.31	1 04 12
17	14 28 28.645	+ 3 35 26.89	14 26 41.523	+ 3 44 59.49	28.818599	0.31	0 48 05
21	14 28 04.414	+ 3 37 42.97	14 26 17.280	+ 3 47 15.93	28.811757	0.31	0 31 57
25	14 27 39.879	+ 3 39 50.05	14 25 52.710	+ 3 49 23.46	28.809502	0.31	0 15 49
29	14 27 15.185	+ 3 41 47.19	14 25 27.976	+ 3 51 21.21	28.811820	0.31	23 55 39
MAY 3	14 26 50.448	+ 3 43 34.03	14 25 03.235	+ 3 53 08.46	28.818663	0.31	23 39 30
7	14 26 25.872	+ 3 45 09.83	14 24 38.638	+ 3 54 44.60	28.829960	0.31	23 23 22
11	14 26 01.597	+ 3 46 33.74	14 24 14.324	+ 3 56 09.07	28.845648	0.30	23 07 15
15	14 25 37.711	+ 3 47 45.60	14 23 50.440	+ 3 57 21.29	28.865655	0.30	22 51 07
19	14 25 14.398	+ 3 48 44.83	14 23 27.136	+ 3 58 20.71	28.889883	0.30	22 35 01
23	14 24 51.843	+ 3 49 30.68	14 23 04.564	+ 3 59 06.86	28.918201	0.30	22 18 55
27	14 24 30.158	+ 3 50 02.78	14 22 42.865	+ 3 59 39.38	28.950445	0.30	22 02 50
31	14 24 09.446	+ 3 50 21.29	14 22 22.174	+ 3 59 58.04	28.986427	0.30	21 46 46
JUNE 4	14 23 49.886	+ 3 50 25.81	14 22 02.605	+ 4 00 02.74	29.025948	0.30	21 30 43
8	14 23 31.563	+ 3 50 16.14	14 21 44.266	+ 3 59 53.41	29.068820	0.30	21 14 41
12	14 23 14.536	+ 3 49 52.60	14 21 27.263	+ 3 59 29.98	29.114851	0.30	20 58 41
16	14 22 58.955	+ 3 49 15.06	14 21 11.705	+ 3 58 52.40	29.163827	0.30	20 42 42
20	14 22 44.946	+ 3 48 23.26	14 20 57.692	+ 3 58 00.72	29.215510	0.30	20 26 45
24	14 22 32.560	+ 3 47 17.47	14 20 45.315	+ 3 56 55.08	29.269638	0.30	20 10 49
28	14 22 21.859	+ 3 45 58.28	14 20 34.650	+ 3 55 35.76	29.325931	0.30	19 54 55

GEOCENTRIC POSITIONS OF PLUTO FOR 0H ET

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DATE	RA (DATE)	DEC (DATE)	RA (1950)	DEC (1950)	TRUE DIST	HP	ET TRANS
	H M S	O ' ''	H M S	O ' ''	AU	''	H M S
JULY 2	14 22 12.964	+ 3 44 25.67	14 20 25.755	+ 3 54 03.13	29.384115	0.30	19 39 04
6	14 22 05.884	+ 3 42 40.02	14 20 18.679	+ 3 52 17.56	29.443932	0.30	19 23 13
10	14 22 00.633	+ 3 40 42.06	14 20 13.468	+ 3 50 19.41	29.505126	0.30	19 07 25
14	14 21 57.305	+ 3 38 31.99	14 20 10.170	+ 3 48 09.06	29.567428	0.30	18 51 38
18	14 21 55.954	+ 3 36 09.99	14 20 08.823	+ 3 45 46.95	29.630550	0.30	18 35 54
22	14 21 56.559	+ 3 33 36.82	14 20 09.454	+ 3 43 13.64	29.694188	0.30	18 20 11
26	14 21 59.137	+ 3 30 53.34	14 20 12.074	+ 3 40 29.75	29.758035	0.30	18 04 30
30	14 22 03.737	+ 3 27 59.82	14 20 16.678	+ 3 37 35.99	29.821799	0.29	17 48 51
AUG 3	14 22 10.295	+ 3 24 57.06	14 20 23.253	+ 3 34 33.03	29.885211	0.29	17 33 15
7	14 22 18.782	+ 3 21 46.02	14 20 31.788	+ 3 31 21.50	29.948008	0.29	17 17 40
11	14 22 29.236	+ 3 18 27.08	14 20 42.269	+ 3 28 02.05	30.009922	0.29	17 02 07
15	14 22 41.637	+ 3 15 00.74	14 20 54.676	+ 3 24 35.39	30.070671	0.29	16 46 36
19	14 22 55.906	+ 3 11 28.04	14 21 08.978	+ 3 21 02.26	30.129969	0.29	16 31 07
23	14 23 12.020	+ 3 07 49.95	14 21 25.127	+ 3 17 23.53	30.187532	0.29	16 15 40
27	14 23 29.960	+ 3 04 06.90	14 21 43.064	+ 3 13 40.05	30.243104	0.29	16 00 14
31	14 23 49.601	+ 3 00 19.96	14 22 02.725	+ 3 09 52.64	30.296457	0.29	15 44 50
SEPT 4	14 24 10.885	+ 2 56 30.10	14 22 24.049	+ 3 06 02.07	30.347373	0.29	15 29 28
8	14 24 33.798	+ 2 52 37.80	14 22 46.974	+ 3 02 09.09	30.395629	0.29	15 14 07
12	14 24 58.261	+ 2 48 43.71	14 23 11.432	+ 2 58 14.51	30.441002	0.29	14 58 48
16	14 25 24.151	+ 2 44 49.01	14 23 37.346	+ 2 54 19.17	30.483267	0.29	14 43 31
20	14 25 51.419	+ 2 40 54.59	14 24 04.624	+ 2 50 23.99	30.522213	0.29	14 28 14
24	14 26 19.983	+ 2 37 00.98	14 24 33.164	+ 2 46 29.86	30.557663	0.29	14 12 59
28	14 26 49.678	+ 2 33 09.35	14 25 02.865	+ 2 42 37.61	30.589472	0.29	13 57 45
OCT 2	14 27 20.429	+ 2 29 20.56	14 25 33.630	+ 2 38 47.99	30.617508	0.29	13 42 32
6	14 27 52.179	+ 2 25 35.05	14 26 05.360	+ 2 35 01.77	30.641638	0.29	13 27 21
10	14 28 24.804	+ 2 21 53.52	14 26 37.955	+ 2 31 19.72	30.661736	0.29	13 12 09
14	14 28 58.157	+ 2 18 17.15	14 27 11.303	+ 2 27 42.64	30.677678	0.29	12 56 59
18	14 29 32.171	+ 2 14 46.63	14 27 45.284	+ 2 24 11.39	30.689362	0.29	12 41 49
22	14 30 06.713	+ 2 11 22.47	14 28 19.769	+ 2 20 46.77	30.696728	0.29	12 26 40
26	14 30 41.601	+ 2 08 05.82	14 28 54.631	+ 2 17 29.50	30.699749	0.29	12 11 31
30	14 31 16.751	+ 2 04 57.28	14 29 29.753	+ 2 14 20.22	30.698411	0.29	11 56 23
NOV 3	14 31 52.077	+ 2 01 57.17	14 30 05.015	+ 2 11 19.55	30.692704	0.29	11 41 14
7	14 32 27.428	+ 1 59 06.14	14 30 40.298	+ 2 08 28.12	30.682626	0.29	11 26 06
11	14 33 02.649	+ 1 56 25.16	14 31 15.476	+ 2 05 46.57	30.668185	0.29	11 10 57
15	14 33 37.670	+ 1 53 54.65	14 31 50.412	+ 2 03 15.56	30.649416	0.29	10 55 48
19	14 34 12.324	+ 1 51 35.01	14 32 24.969	+ 2 00 55.69	30.626395	0.29	10 40 39
23	14 34 46.433	+ 1 49 27.17	14 32 59.014	+ 1 58 47.42	30.599234	0.29	10 25 29
27	14 35 19.922	+ 1 47 31.37	14 33 32.426	+ 1 56 51.15	30.568055	0.29	10 10 18
DEC 1	14 35 52.691	+ 1 45 47.69	14 34 05.086	+ 1 55 07.22	30.532985	0.29	9 55 08
5	14 36 24.582	+ 1 44 16.59	14 34 36.876	+ 1 53 36.00	30.494158	0.29	9 39 55
9	14 36 55.463	+ 1 42 58.72	14 35 07.675	+ 1 52 17.82	30.451720	0.29	9 24 42
13	14 37 25.271	+ 1 41 54.05	14 35 37.355	+ 1 51 13.02	30.405844	0.29	9 09 28
17	14 37 53.835	+ 1 41 02.76	14 36 05.793	+ 1 50 21.83	30.356744	0.29	8 54 13
21	14 38 21.010	+ 1 40 25.39	14 36 32.875	+ 1 49 44.34	30.304662	0.29	8 38 56
25	14 38 46.747	+ 1 40 01.73	14 36 58.501	+ 1 49 20.57	30.249847	0.29	8 23 38
29	14 39 10.961	+ 1 39 51.48	14 37 22.579	+ 1 49 10.47	30.192544	0.29	8 08 18